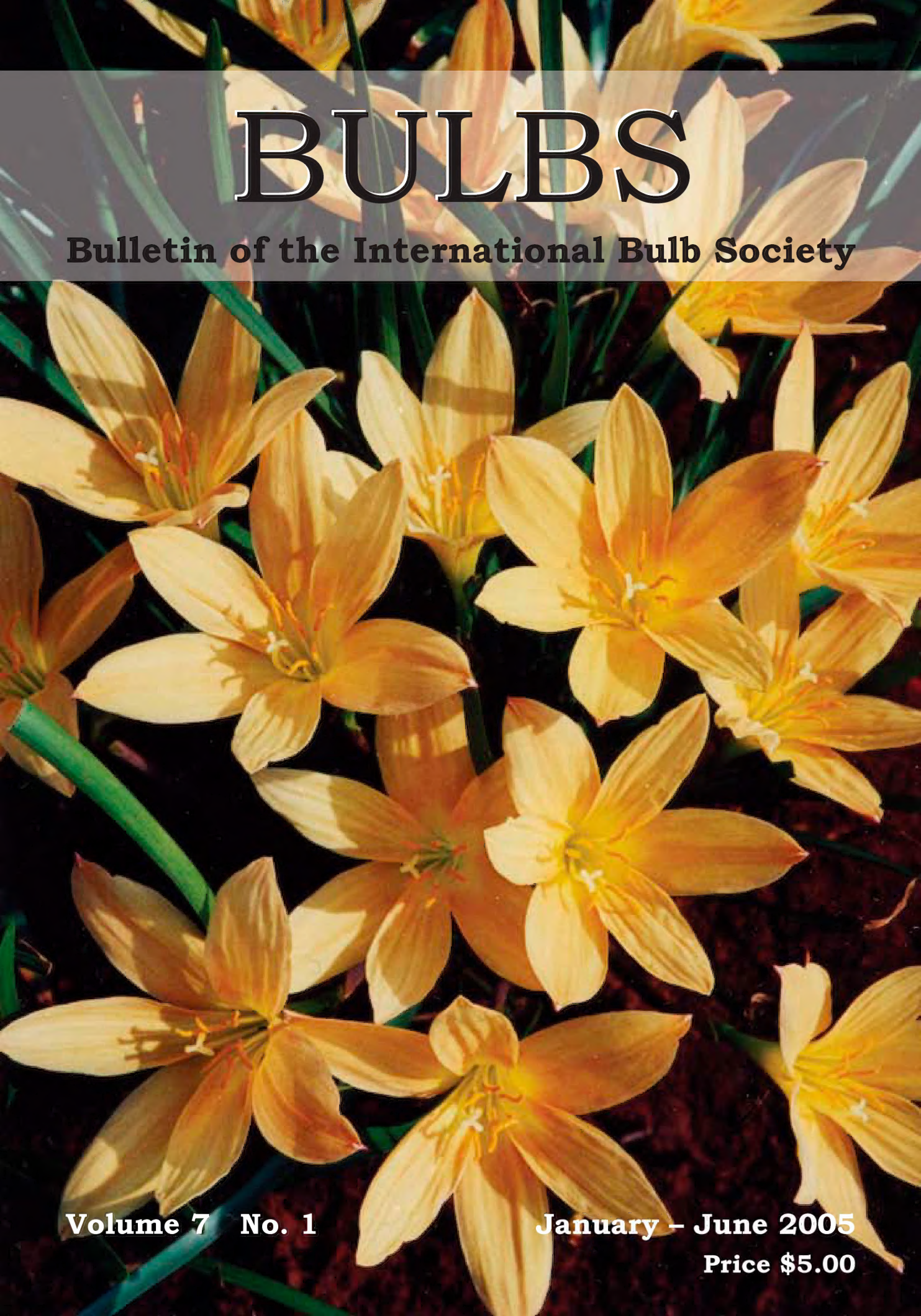




BULBS

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The Bulletin of the International Bulb Society

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COVER PHOTO

Bright yellow/apricot hybrid *Zephyranthes* bred by Fadjar Marta



It has been encouraging to see the recent increase in activity on the IBS Members internet forum which had been relatively quiet for some time. I urge those of you who are not yet taking part in it to join up, if only to give you the chance to benefit from Herb Kelly's stunning seed/bulb exchange. Some of the offerings this year have been amazing and are often snapped up in no time at all. You have to be in to win!

I have selected some of what for me have been highlights from the forum and published them below. This is very much my personal selection of topics that have taken my fancy and which I hope will illustrate the benefits of being online and also make available some of these interesting facts and opinions to a wider audience.

The chaotic business of assembling copy for BULBS continues. There is often a considerable time lag between my first approach to an author and final publication. Deadlines pass, especially my own. Other articles appear on my desk 'out of the blue' and these are the most welcome kind especially as I hate nagging – truly!

In this issue we have a great article by Fadjar Marta, from Indonesia, about his excellent work breeding *Zephyranthes* or rainlilies. Starting with *Zephyranthes citrina* and another called *Z. 'Fadjar's Pink'* he has produced an amazing array of hybrids of different colours and shapes, as the beautiful illustrations show.

Another major and beautifully illustrated article is contributed by Alan Meerow. Entitled "El Desierto Florido" it is about a trip of his to Chile and the remarkable geophytes he encountered on an exciting journey that spanned more than 2000 km.

A couple of the 'out of the blue' type articles are "The Big Thicket" of southeast Texas, by Dave Lehmiller and "Nerine pusilla" by Graham Duncan which is about one of the most rarely-collected species of *Nerine* – the diminutive *N. pusilla* from eastern Namibia.

Articles on *Brunsvigia josephinae* by Alberto Grossi and Bulb Chipping *Haemanthus* by Jim Shields, with a short companion piece of mine on *Worsleya procera*, complete the mix. Finally I have with permission reprinted an article from Systematic Botany (2006)

about our President, Alan Meerow, who was the recipient of the 2005 Peter Raven Award. Our congratulations to him.

Some Forum Highlights

From Alan Meerow:

I have always assumed that the flattened, dry, winged seeds so common in the American Amaryllidaceae (and *Cyrtanthus* in South Africa) had short viability. When I was in Chile a few years back, I asked Maria Teresa Eyzaguirre (the re-discoverer of *Tecophilaea cyanocrocus* in the wild), why the "desert" species such as *Rhodophiala bagnoldii* and *R. phycelloides* ripened their seed at the end of the rainy season. She told me that they could retain their viability for a long time. I was dubious, given experience with *Hippeastrum* seed. Well, I decided to sow the remains of the *Rhodophiala* seed that I collected in Chile in Oct. 2002 because I wanted larger sample sizes for a molecular genetics project I am doing at work.

The seed has been sitting in a refrigerator in paper bags for over 1.5 years. We got close to 100% germination. I am intrigued by the physiological adaptations that this type of seed morphology, homologous to that of *Hippeastrum*, has been able to evolve in its Mediterranean habitat.

Sue Madison on *Lycoris* seed:

Proper treatment of *Lycoris* seed – I always plant them immediately, pushing them about half-way into the medium, with the scar down, seeds exposed to light. They usually germinate fairly quickly. I watch for mold. If they just won't germinate, I carefully peel off the black seed coat. Usually roots appear first, coiling around until they go back down into the medium. The nutrients from the seed are used up in making a little bulb and then some leaves begin to appear. I am told that if you can keep them growing under light and not allow them to go dormant they will grow throughout the year and maturity is greatly speeded up.

So far, I almost always forget to water them and they go dormant and then they are forever on that

regular yearly cycle. With this pattern it takes as long as 7 years to get flowers.

Every so often on forums such as ours the subject of the fungus disease *Stagonospora curtisii* (Berk.) Sacc. comes up. It is also known as red leaf spot, red blotch, and red fire and is one of the commonest diseases of amaryllis. It also attacks *Narcissus* spp. causing the disease known as leaf scorch. The following question about *Stagonospora* was posted by Jack and taken up by several others:

I have an interest in all types of *Zephyranthes* and *Habranthus* species/hybrids. Can anyone direct me to any published materials that speak to disease issues specifically or generally for this group of bulbs. Or, can anyone discuss it here briefly?

Perhaps it is not an issue with these bulbs, but I commonly see rusty red blotches and small streaks on the leaves of some varieties (e.g. *Habranthus tubispathus*). I don't know if they are just part of the leaves as they age, if it is a type of rust or if it is something more problematic. I want to expand my small collection, but don't want to spend time or money and end up with little in return if they are easily wiped out by virus or other disease issues. If this group of bulbs are known to have disease problems, would growing them from seed eliminate the disease or transfer it via the seed?

Jim Shields replied:

I have always assumed that the red fungus on *Habranthus* was the same as on other amaryllids -- *Stagonospora*. You can treat it with fungicides. There are many out there to try; I generally use Cleary 3336 (thiophanate-methyl), a.k.a. Bonomyl. The old Benlate was the best! Try almost any systemic fungicide for a cure and any fungicide to prevent *Stagonospora*.

Karl King wrote:

Have you (or anyone else) observed species or varieties that appear resistant, or even partially resistant, to *Stagonospora*?

Jim Shields again:

I have not noticed particularly, but I have had *Stagonospora* infections on *Crinum* and even on *Clivia*, as well as almost every *Hippeastrum* I've ever grown, and some *Habranthus* and/or *Zephyranthes* as well. I cannot recall having seen *Stagonospora* on *Nerine* or *Haemanthus*. I have seen it on *Scadoxus*.

We seem to do better when we keep the bulbs growing under glass in summer, at least in that we

avoid *Stagonospora*. The previous two summers were quite rainy, and there was a lot of *Stagonospora* in evidence.

And Kevin Preuss also replying to Karl:

I've begun to adopt the theory that this is a reaction to wound, quite possibly caused by thrips and what not....even physical injury to many amaryllids can cause the *Stagonospora* to flair up. It occurs in the wild but not to the degree that you see in cultivated plants. Probably every amaryllid population in the wild that I've seen has signs of it. When plants are getting all their requirements met they are much more resistant, no doubt.

Finally for now an exchange between Karl King and Dave Lehmler about *Sprekelias*:

Karl –

A friend of mine has a few seedlings from a cross of *Habranthus tubispathus* x *Sprekelia*. He would like to attempt the reciprocal cross but his *Sprekelias* have never set seed.

Does anyone have or know a source for *Sprekelias* that will bear seeds? Or seeds for any color variants?

Dave –

In my "limited" experience with intergeneric crosses involving *Sprekelia*, I have never had success with *Sprekelia* as the seed parent unless the pollen donor had *Sprekelia* genes in it; i.e., only when a backcross was involved. But I keep trying every year anyway. Hybridization is not a predictable event; sometimes only 1–2% success rates occur even in intrageneric crosses, so if you do not make the attempt many times, you can never be certain about the possibility.

I did have success this season with an intrageneric cross of *Sprekelia* for the first time, but then I had the unfortunate experience of a mockingbird destroying the seedlings which were growing in a pot on my porch.

Also, I have never found *Sprekelia* to be self fertile. To obtain seeds, I have always needed to have 2 bulbs in bloom at the same time. But this is just my experience with my bulbs.

Well that's enough from me. I hope you enjoy this issue and do remember that this bulletin won't survive without plenty of contributions from you, because I am never going to bore you stiff by writing it all myself!

Brunsvigia josephinae

by Alberto Grossi

“The Josephine’s Amaryllis comes from South Africa. Imported to Europe by a Dutch navigator, one bulb grew in a Dutch garden without blooming for twenty years. About eight or ten years ago it began to flower. Then the bulb has been purchased by HR Empress Josephine for her garden at Malmaison. Since then the bulb has flowered twice, always in summer”. Pierre-Joseph Redouté honored his benefactress, Napoleon’s wife, naming this new Amaryllis and depicting one of the most outstanding bulbs of his time for *Les Liliacées* – 7 (62); tav. 370-371. 1812. But the fame of this bulb has not ended even now – it is the goal of a lot of bulb fans, including me.

The plant was renamed by Ker-Gawler *Brunsvigia josephinae* and published in the Botanical Register in 1817. The genus name *Brunsvigia* is to honor Carl Wilhelm Ferdinand, Duke of Brunswick (1713-1780). 20 species occur in South Africa – 9 in the Cape. *B. josephinae* comes from Karoo, Worcester, and Malgas to Willowmore, where it is known as kandelaarblom, lantanter, or candelabra lily in English. In the wild

they grow on south facing slopes, in sandy to clay soils. The bulb is huge (up to 20 cm diam.), and is one of the biggest in South Africa, partially exposed, and winter growing.

It is hysteranthous so the leaves arise after blooming; 10-20, oblong, greyish, up to 20 cm wide and 60-80 cm long. They are dry at flowering time. The stalk is 40-50 cm high, slightly compressed. The inflorescence is a spreading hemispherical umbel about 60 cm wide, with 30-40 flowers. These are zygomorphic, dark-red, and orange-yellow toward the base. Each flower has a perianth tube to 15 mm long, tepals 45-80 mm long, strongly recurved. The papery capsule is 30-50 mm long, more or less cylindrical. The seeds are small, fleshy, green and pea like. They are dispersed when the capsule ruptures as a result of the tumbling of the inflorescence blown by the wind. The flowers are pollinated by species of sunbirds, in contrast to other species of *Brunsvigia* where noctuid moths and satyrid butterflies are usually involved.

I obtained my bulbs from a Southern African



nursery. I planted a few bulbs in an unheated frame (where frost has been experienced more and more) and three bulbs in a big 60 cm diameter clay pot (free of frost). The soil in both cases was sandy. After a few years I lost all bulbs in the frame, but the three in the pot got bigger and bigger and this year they bloomed. In winter the pot is in a sunny, frost free place – when fog and clouds are absent. In spring I move the pot outside in a south facing walled place and after the leaves have yellowed (May-June).

The pot does not receive any water other than the rain in summer. I had just got back from my vacation in August and to my surprise I found two bulbs with two arising stalks each. In a few weeks they flowered, ripened seeds and detached from the bulbs. Afterwards they began to get leaves. From over 130 flowers I harvested only 5 seeds (I did not pollinate them), that in a month germinate. It is said that *B. josephinae* needs about 12-14 years before reaching blooming size from seed. Another quick way to propagate the species is from offsets, around the mother bulb. The only pest I noted on my bulbs is mealy bug.



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From original plate taken from 'Bilderbuch zum Nutzen und Vergnügen der Jugend' by F.J. Bertuch, Wien, 1801



Bulb among the roots of olive, photo taken in January 2006 at Botanic Gardens of Villa Hanbury, La Mortola, Italy



Born 1960. I am a physician with a specialization in gastroenterology and homeopathy. I am studying for a degree in Botany.

I have grown plants since I was 13 years old. My interest is in bulbs, above all Amaryllidaceae then Iridaceae, and I grow orchids, gingers, succulents and jasmines too. I am founding member and Italian correspondent of the newly founded WGI (Water Gardeners International – <http://www.watergardenersinternational.org/index.html>). I write monthly for an Italian magazine, *Il Giardino Fiorito*.

El Desierto Florido

by Alan W. Meerow

The Northwestern corner of Chile encompassing the Atacama Desert, considered the driest place on earth, becomes less severe as one moves below the Tropic of Capricorn. The “camanchacas,” the coastal mists, provide sufficient moisture for plant survival, but it is only during an El Niño event that abundant rains bring forth a paroxysm of color and diversity from the desert sands. The “flowering desert” phenomenon brought me to Chile in 2002 – my host Miguel Gomez of the Department of Plant Science in the Pontificia Catolica University in Santiago. October is a prime month to catch the explosion of color at its peak, and it was the last week of October that I arrived in Santiago. I would be collecting seed and leaf samples for population genetics studies of *Rhodophiala* species, as well as molecular phylogenetic studies of these and other Chilean Amaryllidaceae.

Miguel and his Ph.D. mentor, Dr. Gloria Montenegro, were formerly in the Department of Ecology within the College of Biological Sciences at the University. The Dean of the University became concerned that the College of Agronomy and Forestry was lacking a faculty with a basic science orientation, and Dr. Montenegro and Miguel were transferred to the Department of Plant Science, where the emphasis is primarily on horticulture. On my visit to the department, I was pleasantly surprised to run into Dr. Mark Bridgen of Cornell University, who was in Chile to work with his former graduate student, Dr. Eduardo Olate, now a professor in the department. Eduardo and his students are involved in developing Chile’s vast wealth of geophytic plants for horticultural use.

Miguel had examinations to give before we could head out to the field, so he put me in the capable hands of Luis Gonzalez, Dr. Montenegro’s technician, and a superb field botanist in his own right. We headed out to a forest preserve, Santuario El Roble, about 30 miles

northwest of Santiago. The reserve, at the western fringes of the Chilean coast range, is the northernmost outpost of the austral genus *Nothofagus*. Between 5400 and 5600 feet elevation, among rocks and low shrubs, I encountered my first Chilean amaryllid in bloom, *Phycella ignea* (Fig. 1). *Placea arzae* grew nearby, but it was still too early for flowers. *Leucocoryne ixioioides* (Fig. 2-3) adorned the roadsides and forest edges, and



Fig. 1



Fig. 2



Fig. 3

two irids, *Olsynium junecum* (Fig. 4) and *Solenomelus pedunculatus* (Fig. 5) were also in full flower. Also ubiquitous was *Pasithea caerulea* (Hemerocallidaceae; Fig. 6).

The following day, Miguel, Luis and I began our journey that would span more than 2000 km. We set out towards the Pacific coast. It wasn't long before we saw masses of *Leucocoryne violescens* (Fig. 7) along the roadside, along with *Alstroemeria magenta* (Fig. 8). In Coquimbo Province near the coast, below 100 m elevation, large drifts of *Leucocoryne coquimbensis* (Fig. 9) delighted the eye. Not far inland from the coast, a large field hosted a sizable population of *Rhodophiala phycelloides* (Figs. 10-11) interspersed with patches of *Leucocoryne vittata* (Figs. 12-14). This boldly patterned species is very variable and, in my opinion, second only to *L. purpurea* for extravagant beauty. Closer to the coast, *Rhodophiala bagnoldii* was in full bloom in a pasture (Fig. 15). It seemed as if every other flower provided haven for a yellowish-green beetle which resolutely refused to be dislodged. As we pushed to the north, we discovered a second but smaller population of *Rhodophiala phycelloides* whose brilliant red flowers were over-shadowed by the beauty of *Alstroemeria magnifica* (Fig. 16). The afternoon shadows were growing long, and we decided to look for accommodation in a nearby town.

The next day, we pushed north into Atacama Province. The vegetation had grown progressively more xeric, and cacti were now frequent companions. Just

north of Vallenar, we found the diminutive *Alstroemeria kingii* (Fig. 17-18) in flower, the lone spot of color in the seemingly barren and rocky soil. As we snaked through the desolate mountains, one would catch brief glimpses of the sea. Here and there, a few vicuña could be seen grazing on the steep slopes of the coast range. A few kilometers southeast of Carrizal Bajo, I was treated to the sight of the legendary *Leontochir ovallei* (Fig. 19-20) in full flower, the monotypic third genus of the Alstroemeriaceae, found only in a few



Fig. 5



Fig. 4



Fig. 6

sites near the coast of Atacama province. Growing nearby was the shrubby and succulent *Oxalis gigantea*, and a leathery, mottled-leaved *Aristolochia* species.

As we wound our way towards the shore, we spied two desert species of *Alstroemeria*, *A. pallida* (Fig. 21) and *A. werdemannii* (Fig. 22). At the foot of a fruiting columnar cactus (*Echinopsis chiloensis*), the large flowers of *A. magenta* shimmered in the dry, but cool air. It always seemed slightly incongruous to find such showy flowers erupting from the parched gravels and



sands of the Atacama.

The sandy flats along the Pacific were a sight to behold. There, vast stands of *Rhodophiala bagnoldii* (Figs. 23-25), literally tens, if not hundreds, of thousands of yellow to yellow-orange flowers, stretched on for kilometers. Every possible shade of yellow was represented. The local people are justly proud of their native “añañucas” (the most common vernacular name for *Rhodophiala* species in Chile), and fiercely protective of the large stands contained within the borders of national parks. Anyone seen picking the flowers is likely to get a furious tongue-lashing (or worse) from residents. In other sandy washes, the delicate, pale blue-tinged flowers of *Zephyra elegans* (Tecophilaeaceae; Fig. 26) contrasted beautifully with the deep purple flowers of *Conradinia* (Portulacaceae).

The next morning we climbed to about 480 m above sea level as we pushed on toward the north, encountering two additional *R. bagnoldii* populations. The throats of many of the flowers were filled with a dark-bodied bee; in some cases as many as five of the insects were jammed into the perianth. The bees were sluggish in the cool morning air and tended to retreat further into the flower when disturbed (though a few buzzed past my face angrily if I shook the stem vigorously enough). As with the beetles observed in the previous population, I couldn't say whether these were in fact the pollinators of *R. bagnoldii* or merely opportunists seeking shelter until the day warmed up.

In the afternoon, we turned back towards the



Fig. 10



southeast, heading inland towards Vicuña from La Serena and rising to nearly 1400 m. Flowering among the rocks on leafless stems, the spotless *Alstroemeria schizanthoides* (Fig. 27) provided occasional relief from the sparse vegetation of the desert hills. At times, mounting a pass into a new valley, there would suddenly appear a vast swathe of green where irrigation supported vineyards or orchards of cherimoya (*Annona cherimola*).

On the morning of our last day in the desert, we visited the Fray Jorge National Park, designated as a World Biosphere Reserve by UNESCO. Amidst coastal desert, across a 400 hectare (880 acres) area, grows a remnant humid Valdivian forest, a relict of the Quaternary when the Atacama supported moist forest. Annual rainfall is only 113mm (4.4 in), and the forest exists only because of the life-giving condensation of the coastal fog, the *camanchaca*. Tree, shrub and fern species are found in this area, along with *Lapageria rosea*, the national flower of Chile, that are next seen 1,250 km (781 miles) to the south.

The hills flanking the forest are typical Chilean coastal desert, rich with cacti, spiny shrubs, and, of course, geophytes. *Rhodophiala phycelloides* (Fig. 28) was in full bloom, at about the same density as the first large population we had seen to the south, but at higher elevation (300 m) and on sloping ground. But the mystery of the day was encountered just outside

the park, at the edge of pasture and cultivated fields. A lovely, reddish-orange *Rhodophiala* was in bloom, looking like a robust *R. advena* (Fig. 29). It occurred sporadically in a relatively small area, along with variants such as a pink form (Fig. 30) and a light apricot (Fig. 31).

We continued south to Valparaíso, one of Chile's most picturesque and prosperous cities. Near Ligua, *Alstroemeria pulchra* (Fig. 32) was in full bloom. On the coast between Papudo and Valparaíso, in rocky cliffs near the sea, *Alstroemeria angustifolia* (Fig. 33) grew with an orange-flowered form of *Rhodophiala bagnoldii*. A beautiful ground orchid, *Bipinnula fimbriata* (Fig. 34), with its curious fringed sepals, was in full flower as well. The dainty nodding blue flowers of *Conanthera campanulata* (Fig. 35; Tecophilaeaceae) were seen in abundance.

After lunch in Valparaíso, we zoomed back to Santiago. The following day, I had the opportunity to head up into the Andes west of Santiago with Luis. The snows were rapidly retreating, but it was still far too early for the Andean wildflower show. Still, where the snow had exposed the bare ground, *Rhodophiala rhodolirion* had produced a flush of leaves, and a small *Tristagma* was already beginning to flower. These would serve to whet my appetite for another visit sometime in the future, when the Andean bulbs would be in full flower.

FIGURE LEGENDS

Fig. 1. *Phycella ignea*.

Fig. 2-3. *Leucocoryne ixiooides*.

Fig. 4. *Olsynium junceum*.

Fig. 5. *Solenomelus pedunculatus*.

Fig. 6. *Pasithea caerulea*.

Fig. 7. *Leucocoryne violescens*.

Fig. 8. *Alstroemeria magenta*.

Fig. 9. *Leucocoryne coquimbensis*.

Fig. 10-11. *Rhodophiala phycelloides*.

Fig. 12-14. *Leucocoryne vittata*.

Fig. 15. *Rhodophiala bagnoldii*.

Fig. 16. *Alstroemeria magnifica*.

Fig. 17-18. *Alstroemeria kingii*

Fig. 19-20. *Leontochir ovallei*.

Fig. 21. *Alstroemeria pallida*.

Fig. 22. *Alstroemeria werdmannii*.

Fig. 23-25. *Rhodophiala bagnoldii*.

Fig. 26. *Zephyra elegans*.

Fig. 27. *Alstroemeria schizanthoides*.

Fig. 28. *Rhodophiala phycelloides*.

Fig. 29. *Rhodophiala* aff. *advena*.

Fig. 30. *Rhodophiala* aff. *advena*, pink form.

Fig. 31. *Rhodophiala* aff. *advena*, apricot form.

Fig. 32. *Alstroemeria pulchra*.

Fig. 33. *Alstroemeria angustifolia*.

Fig. 34. *Bipinnula fimbriata*.

Fig. 35. *Conanthera campanulata*.





Fig. 14



Fig. 17



Fig. 15



Fig. 18



Fig. 16



Fig. 19



Fig. 20



Fig. 23



Fig. 21



Fig. 22



Fig. 24



Fig. 25

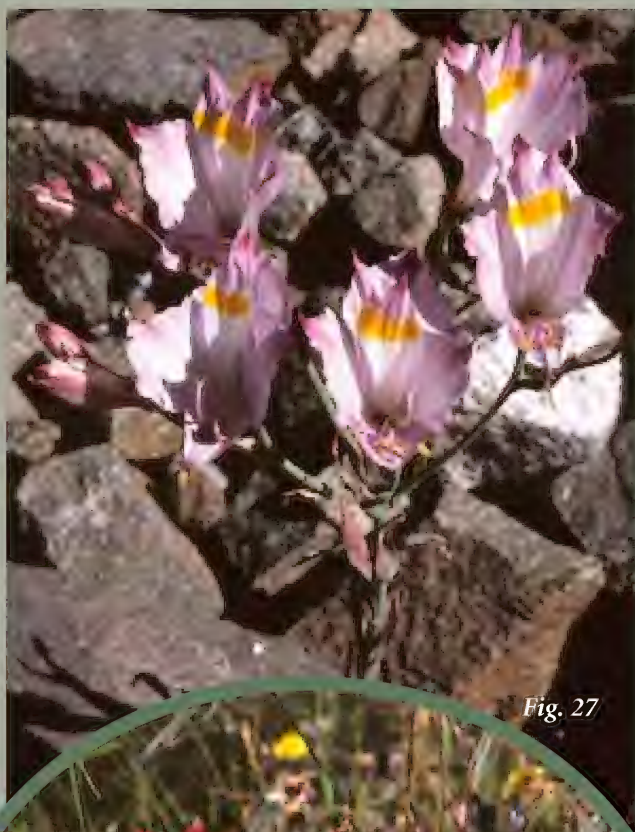


Fig. 27



Fig. 28



Fig. 26



Fig. 29



Alan W. Meerow—Recipient of the 2005 Peter Raven Award

JAVIER FRANCISCO-ORTEGA

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Alan Meerow. Field studies in Puerto Rican forests, 2005.

Alan W. Meerow was born in the Bronx, New York, the second son of a garment center laborer. His blue collar neighborhood was ringed by greenery, and perhaps most importantly, it was within walking distance of the New York Botanical Garden. “The proximity of that august institution would, apparently at least, invade my subconscious mind,” he suggests. Yet science, and more specifically botany, was far from his mind in adolescence, even while a student at the Bronx High School of Science. He attended the State University of New York at Buffalo, intending to study creative writing, but left after one year and moved to California.

While “trying to write the next great American novel” in Santa Cruz, California, Alan began to work in the landscape and nursery industry that flourished around Monterey Bay, and became fascinated with the plant communities of the Santa Cruz Mountains. “John Hunter Thomas’ flora of the region became my botanical primer,” and he used that book to learn how to use a dichotomous key and understand botanical terminology. As the years went by, he broadened his botanical horizons, visiting the Mohave desert in a particularly good spring, Munz’ *A California Flora* in hand. He began writing a gardening column in a

local weekly newspaper. “As I became more involved with botany and horticulture, the two fields began to look like a fair trade to support my still active artistic pretensions as a writer.” This led him back to college, this time at the University of California, Davis, where he pursued a course of study equally divided between botany and environmental horticulture. At 23, he was four years older than the typical sophomore, and dove enthusiastically into plant taxonomy, anatomy, morphology, ecology and paleobotany with the likes of Grady Webster, John Tucker, Ernest Gifford, Mike Barbour, and Daniel Axelrod. “Incoming *Systematic Botany* editor-in-chief Alan Whittemore sat behind me in John Tucker’s plant systematics class.” He also made the acquaintance of Bijan Dehgan, a graduate student of Webster’s, who supervised the UCD Botany Conservatory while finishing his doctorate on the systematics of *Jatropha* (Euphorbiaceae). “Bijan, who had also successfully integrated horticulture and botany in his career, had accepted a faculty position with the University of Florida Environmental Horticulture Department,” Alan recalls. “We discussed the possibility of my pursuing graduate studies in plant taxonomy with him in Gainesville once I graduated

from UC, Davis.”

One of the most formative experiences of his time at Davis would forever orient him towards the tropics. Alan spent the summer of 1977 in Costa Rica, living and working at Linda Vista S.A., the company run by legendary flower breeder Claude Hope. At times by himself, or in the company of the company’s plant breeder and orchid aficionado Leon Glicenstein, Alan traversed Costa Rica’s diverse territory, adding thousands of new plants to his taxonomic vocabulary. “I became particularly intrigued by the many species of *Bomarea* (Alstroemeriaceae) and epiphytic Ericaceae, and began to consider both as prospective subjects for graduate work.” The experience in Costa Rica would also later inspire Alan’s first contribution to *Horticulture* magazine, “The Cloud Forests of Costa Rica.”

Leaving California upon graduation in December, 1978, Alan returned to the east coast with little else planned other than beginning graduate school in the fall. He began to look for something to occupy himself for the nine month duration, and, through Davis connections, landed the position of interim greenhouse manager at the Marie Selby Botanical Garden in Sarasota, FL. When asked, a few months later, to consider staying on in the permanent position, Alan decided to postpone graduate school for at least a year.

“Selby was a wonderful experience,” he recalls. He quickly began to acquaint himself with Florida’s subtropical flora with the same alacrity as he had with California’s vegetation, as well as the extensive collections of epiphytic plants that had become Selby’s specialty. “Cal Dodson, Selby’s director at the time, knowing that I intended to pursue graduate study in plant systematics, began urging me to consider a family whose representation in the South American flora was significant but poorly understood, the Amaryllidaceae.” Adding his encouragement in that direction was the late ethnobotanist and taxonomist Tim Plowman of Field Museum, who was a frequent visitor at Selby on his way to and from his extensive field trips.

In 1981, Alan formally began his graduate work at the University of Florida under Bijan Dehgan’s supervision, choosing the genus *Eucharis* (Amaryllidaceae) as the subject of his dissertation work. Walter Judd joined his graduate committee and became “like a second major professor to me,” Alan relates. “It was in Walter’s advanced plant taxonomy class that I also met one of his master’s degree students, Linda Fisher.” Linda and Alan were married one year later at her family’s summer cottage on Lake Ontario. “The old growth lake shore woods were carpeted with *Trillium grandiflorum* on our wedding day,” Alan remembers, “as good an augury as any for a monocot specialist.” The couple honeymooned in Peru and Ecuador, hunt-

ing amaryllids in the Andes for two months.

In December 1986, Alan graduated with his doctoral degree, for which he received both NSF and World Wildlife Fund/Garden Club of America support. He already had five peer-reviewed journal articles published. His dissertation, “A Monograph of *Eucharis* and *Caliphruria* (Amaryllidaceae)” was awarded that year as the best dissertation published by the Institute of Food and Agricultural Sciences of the University of Florida. That month also heralded the birth of the Meerow’s first daughter, Sara Anne. He began a post-doc in Gainesville.

“It was not an easy time in the job market for budding plant systematists,” Alan recalls. “Fortunately, my dual background in botany and horticulture gave me some leeway in the search for an academic position I was encouraged by UF Environmental Hort chairman Tom Sheehan to apply for a teaching and extension position at UF’s Fort Lauderdale Research and Education Center. It wasn’t exactly what I had in mind, but to my surprise, an offer was tendered.” In July, 1987 his family moved to Fort Lauderdale, and Alan attended his first International Botanical Congress in Berlin.

The next thirteen years would be hectic ones for Alan. His family grew by two; Andrew, born in 1989, and Erica, who arrived in 1993. He created and taught three courses in UF’s satellite campus teaching program: “Principles of Horticultural Taxonomy,” “Palm Production and Culture,” and “Orchidology.” As extension “Palm and Tropical Ornamental Specialist” for the University of Florida, Alan gave nearly 400 presentations on plant related topics to audiences of nursery and landscape professionals, national and regional garden clubs, Master Gardeners, botanical garden support groups, public school classes, and 4H clubs. He published 4 books oriented to a lay audience, over 30 extension publications, videos or software, and nearly 70 articles in the popular press on plants. While at UF, he published a quarterly newsletter called “Tropic-Line,” which reached an audience of nearly 10,000. He is known widely in horticultural circles for his popular books “*Betrock’s Guide to Landscape Palms*,” and “*Betrock’s Cold Hardy Palms*” as well his co-authorship of “*Betrock’s Reference Guide to Florida Landscape Plants*” and “*Ornamental Palm Horticulture*.” Alan published the first research articles in the U.S. on the use of coir dust as a peat substitute in horticulture. He has also released over two dozen new ornamental plants to the greenhouse and nursery industry, and has patented one alstroemeria and three amaryllis hybrids. “Whenever possible, to whatever audience, I have striven to impart some message about the importance of plant systematics and plant conservation relative to horticulture,” Alan relates. He was recognized by

the Florida Nurserymen and Growers Association as Horticultural Writer of the Year in 1990, and Educator of the Year in 1991.

Impressively, Alan also maintained his activity as a plant systematist, publishing nearly 100 papers in diverse scientific journals and receiving National Science Foundation support for his work. He began an active research collaboration with Brazilian scientists that would bring him to Brazil on six separate occasions. He spent an academic sabbatical at the Royal Botanic Gardens, Kew and the National Botanic (now Biodiversity) Institute in Kirstenbosch, South Africa. He was named 1998 recipient of the International Bulb Society’s William Herbert Medal in recognition of his work on Amaryllidaceae. He was promoted to Associate Professor in 1992, and, in 1994, successfully petitioned for a change in his academic appointment to 50% research. In 1998, he was promoted to Full Professor.

“Oddly enough,” Alan notes, “my reputation among lay audiences mostly centers around palms, and people are often surprised to find that my active research projects are focused around tropical geophytes.”

In 1999, Alan accepted the position of lead scientist in a new genetics and germplasm program for tropical ornamentals at the USDA National Germplasm Repository in Miami. “What attracted me to Chapman Field was, first of all, the history of the place

(David Fairchild spent his USDA career directing the tropical plant introduction program at the site), and secondly, the fact that my new colleague Ray Schnell was rapidly building up the best plant molecular biology lab in South Florida.” There, Alan has continued his work on the traditional and molecular systematics of Amaryllidaceae and other families, and expanded into population genetics of *Iris*, *Zamia*, and other taxa.

In addition to his extensive efforts at public communication, Alan has served as chair of the Bulb Specialists Group of the IUCN/ Species Survival Commission, chair of the ASPT Publicity Committee and ad hoc Outreach Committee, and as a member of the Public Education and Natural Resources Committees of the Systematics 2000 Task Force. He is currently an associate editor of *Systematic Botany*, and was a former associate editor of the journal *HortScience*. He is also President of the International Bulb Society, and editor of the IBS scientific journal *Herbertia*. He is a research associate of Fairchild Tropical Botanic Garden.

“No matter what the subject of my talk,” Alan states, “I always find some way to weave the significance of basic botanical knowledge into the fabric of the everyday use of plants. There is no greater reward than, at the close of a garden club or school class presentation, being told, ‘I really learned a lot from your talk.’ I firmly believe that we cannot afford to reside in an ivory tower and expect our science to thrive into this new century.”

**Below is a list of IBS members
who made contributions to the Society’s
various funds during calendar year 2005:**

James Denning	Kristin Jakob	Nickolas Nickou
Timothy Evans	Herb Kelly	James Shields
Kirby Fong	Deanna Larson	Everett Skinner
Charles Gorenstein	Dave Lehmler	Sir Peter Smithers
Alastair Gunn	David McLean	Prof. Karl Zimmer
Sue Haffner	Alan Meerow	LEF Foundation
Byron Hershey	Elizabeth Winston Mize	

Nerine pusilla

NAMIBIA'S DWARF NERINE

Graham Duncan

PHOTO BY THE AUTHOR

One of the most rarely-collected species of *Nerine* is the diminutive *N. pusilla* from eastern Namibia. It was discovered in 1912 by the German botanist and botanical collector, Moritz Kurt Dinter (1868-1945), who in the late 1890's served as Curator of the large collection of primarily South African succulent and bulbous plants at the gardens of La Mortola on the Italian Riviera. In June 1897 he arrived at Swakopmund in the former German territory of South West Africa, where he served as official botanist until 1914. He travelled extensively throughout the country and collected *N. pusilla* for the first time in January 1912 near Steinhausen, north-west of Gobabis in Hereroland in arid eastern Namibia, where he found it growing in large numbers. He cultivated it at his headquarters at Okahandja in central Namibia, and published it as new in his book titled *Neue und wenig bekannte Pflanzen Deutsch-Südwest-Afrika*, in 1914.

Only known from around Steinhausen, *N. pusilla* is recorded as growing in limestone pans and river beds. Under its harsh natural habitat, where summer rains are highly erratic, and prolonged droughts may span years, it is not surprising that it has been so seldom collected. The opportunistic, dormant bulbs respond rapidly to summer rain storms from October to January, first producing leaves, followed by flowers from late December to mid-January. Under cultivation, the unscented individual flowers last five to six days, and seed maturation is extremely rapid with the fleshy rounded seeds ripening within two weeks. They then drop to the ground and germinate immediately. Following seed maturation, the infructescence desiccates quickly within a couple of weeks and the scape breaks off at the base. The bulbs lose their leaves in late summer and undergo a completely dry winter dormant period.

The specific epithet *pusilla* refers to the small overall size of the plant that reaches only 120-180 mm high when in flower. It is easily recognised in a vegetative state by its oblong-ovoid bulb and two to

four thread-like, spreading leaves with a shallow longitudinal groove along the upper surface. The scape and pedicels are minutely pubescent and the latter are rather variable in length, even within the same inflorescence, growing from 22-60 mm long. The white tepals have pinkish median keels and are strongly recurved, with their tips distinctly bearded on the inner side. The stamens are strongly bent downwards and upwards, and the filaments may be dark pink for their entire length or dark pink at the base, shading to pale pink above. The style is similarly strongly bent downwards and upwards, and has a conspicuously large, three-lobed stigma.

N. pusilla is vaguely reminiscent of another endemic Namibian geophyte - the dwarf *Ammocharis nerinoides*, previously known as *Crinum nerinoides*. The distribution of the two species overlaps in the Gobabis district, but *A. nerinoides* has a wider dis-



tribution in northern, north-eastern and eastern Namibia, also occurring in seasonally inundated limestone pans and river beds. *A. nerinoides* has a spreading, few-flowered umbel of much larger, funnel-shaped, pale to deep rose-pink flowers that are heavily sweet-scented, and similar long, spreading linear leaves that are wider and more deeply grooved and minutely toothed along their margins. The flowering

period of the two species overlaps in December and January with *A. nerinoides* usually beginning flowering a month earlier in mid-November.

The accompanying photograph was taken of a pot of plants kindly donated to the Kirstenbosch bulb collection by bulb enthusiast Eric O'Neil of Somerset West, near Cape Town. He had originally received them from another bulb enthusiast Dannie Gildenhuys of Cape Town, who had gathered the bulbs in eastern Namibia in December 1990 on a farm east of Steinhausen, in Hereroland. According to Dannie Gildenhuys, *N. pusilla* grows together with *Ammocharis nerinoides* at this locality. Following heavy rains, both may at times be seen in flower with their bulbs and leaves fully submerged.

In the publication *Grow Nerines*, I speculated that *N. pusilla* might possibly fall into the evergreen group of species when grown in temperate climates or under greenhouse protection, which is in line with other members of the genus with filiform leaves that follow this growth cycle. I had at that stage not cultivated the plant myself, but having subsequently obtained living material, it has clearly shown itself to fall into the exclusively summer-growing group of six species that currently includes *N. bowdenii*, *N. duparquetiana*, *N. krigei*, *N. laticoma* subsp. *laticoma*, *N.*

laticoma subsp. *huttoniae* and *N. marincowitzii*.

Within the developing field of genome size measurement, it has been shown that when species in a genus have the same chromosome number, as in *Nerine* ($2n = 22$), differences in nuclear DNA content have proven to be very effective in delimiting species and infrageneric divisions in a number of taxa. In a recent study of the species of *Nerine*, correlation was demonstrated with their nuclear DNA content, growth cycle, leaf width and other morphological characters. When arranged according to increasing nuclear DNA content, the species fell into three distinct groups if growth cycle (under temperate conditions) and leaf width were also considered: a narrow-leafed, evergreen group of 13 species had a DNA content from 18.0–24.6 picograms (pg), a broad-leafed, winter-growing group of four species had a DNA content from 25.3–26.2 pg, and a broad-leafed, summer-growing group of six species had a DNA content from 26.8–35.3 pg. *Nerine pusilla* proved to be exceptional in that despite falling into the latter group on account of its high DNA content of 28.0 pg and its summer growth cycle, it has narrow leaves, which may be a secondary adaptation to its habitat in Namibia.

Cultivation

Although extremely rare in bulb collections, *Nerine pusilla* is an excellent species to grow as a pot subject and presents no great difficulty in this regard provided that its summer growth and winter dormancy cycles are simulated as closely as possible. It is tender and should be grown in exactly the same manner as its Namibian counterpart, *Ammocharis nerinoides*. The dwarf habit and deciduous nature of *N. pusilla* renders it unsuitable for general garden use even in mild climates, and cultivation in pots is really the only practical manner in which to maintain it successfully over an extended period. As with most geophytes, the growing medium should have perfect drainage and a recommended mixture is three parts coarse river sand and one part finely milled bark or compost, with a 2–3 cm layer of compost or finely milled bark placed at the bottom of the container into which the roots can penetrate. The elongated bulbs are planted with the tops of their long necks resting just below soil level. Like *Ammocharis nerinoides*, this strictly summer-grow-

ing species thrives on heavy drenching approximately once every ten days to two weeks, from early to late summer. During winter dormancy, the bulbs should not be watered at all and they prefer to remain in their dry soil medium throughout the winter months in order to prevent desiccation of their perennial fleshy roots.

Like the bulbs of *A. nerinoides*, those of *N. pusilla* are solitary and thus the only feasible means of propagation for the home gardener is by means of seeds harvested just before the membranous fruit walls rupture and disintegrate. Seeds should be sown as soon as possible just below the surface of the same medium recommended for adult bulbs, and placed in an area receiving bright light. The plants are generally pest-free although a close watch should be kept on mealy bugs that would almost certainly find themselves at home at the bases of leaves and between the bulb tunics. Fungal rotting of the bulbs would result from a poorly drained medium and failure to adhere to a dry winter regime.

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The Big Thicket

David J. Lehmiller, M.D.

ALL PHOTOS BY THE AUTHOR

The Big Thicket of Southeast Texas, once known as The Big Woods, is an ill defined geographical area that originally encompassed three million acres, lying just to the north of Beaumont and to the northeast of Houston. Considered to be the crossroads of North American ecology, the Big Thicket harbors eight distinct plant communities, making it one of the most biological diverse localities in the world. Nature brought together this clustering of ecologies during the last glacial period. It is estimated that greater than 1,000 different geophytes are found within this region, and it is also home to more than 350 bird species.

Following the Civil War, this area was subjected to intense lumbering activities, and vast expanses of pine and cypress trees were cut down. Farming and oil exploration followed, and soon the original Big Thicket was carved up and exploited. Today, only remnants remain, largely confined to the nine land units of the Big Thicket National Preserve centered about the Pine Island Bayou, a major tributary of the Neches River. Tracts of land in the Alabama-Coushatta Indian Res-

ervation still preserve islands of virgin pine forest.

The diversity of ecologies in the Big Thicket brings an unusual assortment of flowering plants to within close proximity of one another. Within the Big Thicket, one may encounter orchids, cacti, pitcher plants, legumes, iris, and bulbous plants. Ajilvsgi (1979) recorded 475 different wild flowers within the Big Thicket.

The Visitor Information Center of the National Preserve is located seven miles north of Kountze, Texas. There are several walking trails though portions of the land units, and additional access is afforded via four separate water corridors. My experiences have largely centered about the Pine Island Bayou, a swampy waterway that I have explored extensively in a flat bottom boat (Lehmiller, 1987). I reside on property that once was part of the Hunter's Thicket or Traditional Thicket, a swampy wooded ecology nestled within the southern portion of the Big Thicket. The water drainage from my property flows into a branch of the Pine Island Bayou.



Fig. 1

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FIGURES

1. Cypress swamp, Pine Island Bayou, Big Thicket Preserve, Southeast Texas.
2. *Crinum americanum* L.
3. *Hymenocallis liriosme* (Raf.) Shinnery.
4. *Iris virginica* L.
5. *Iris brevicaulis* Raf.
6. *Nymphaea odorata* Ait.
7. *Allium canadense* L. var. *mobile* (Regal) M. Ownbey.
8. *Allophia drummondiana* (R.C. Graham) R. Foster.





Fig. 4



Fig. 5



Fig. 6



Fig. 7



Fig. 8

Breeding Rainlilies *

by Fadjar Marta

ALL PHOTOS BY THE AUTHOR

Around 25 years ago, when I visited one of my best friends, Jack Craig in Tambun, West Java, he gave me some seeds of *Z. citrina* and some bulbs of a large pink flowering *Zephyranthes* which I thought was *Z. grandiflora*. Within quite a few years those starts had multiplied into around 7,000 flowering sized bulbs of each of those species of *Zephyranthes* and I started my hybridizing project by utilizing them as my parent stocks.

With the pink flowering one as mother plant and *Z. citrina* as pollen donor, I got 100% true hybrids, however, with *Z. citrina* as mother plant and the pink flowering one as pollen donor, I got no hybrids. Later on I was informed by Dr. Thad Howard, John Fellers and Paul Niemi that *Z. citrina* is apomictic and that was why I didn't have any success when I utilized it as mother plant in my hybridizing project.

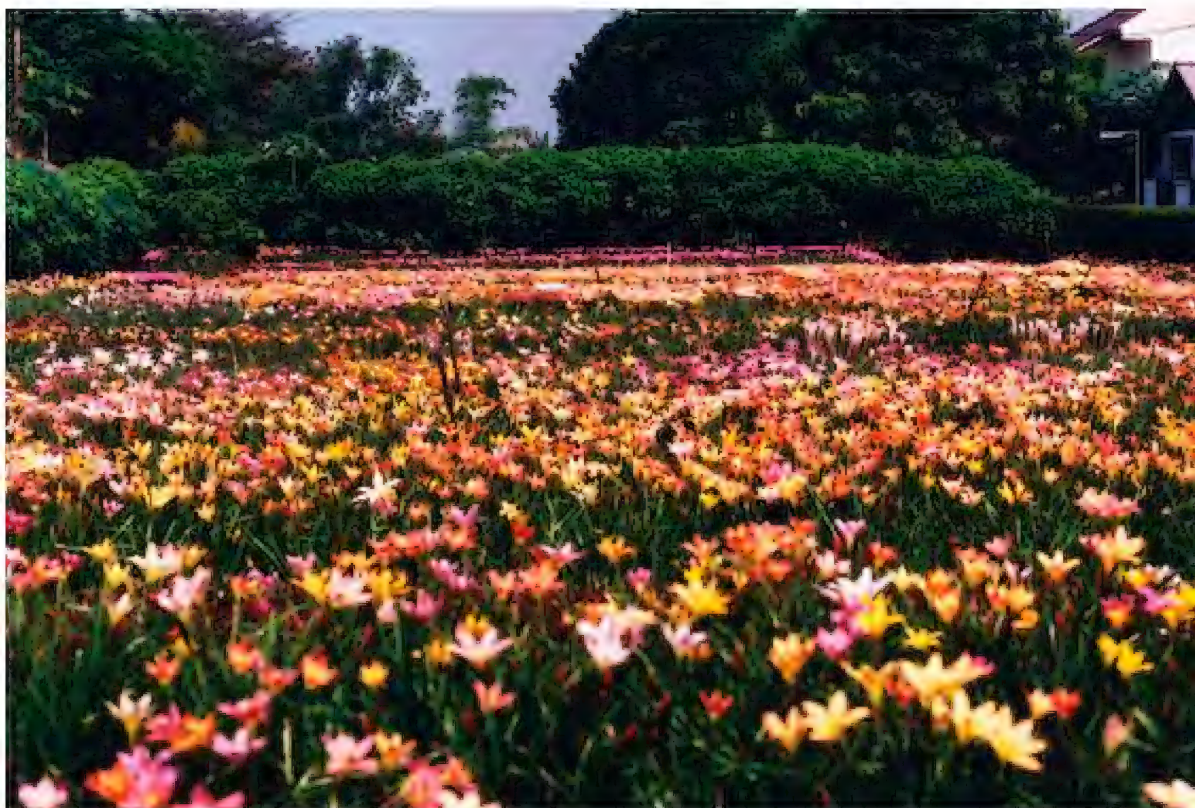
Being apomictic, *Z. citrina* could not be utilized as a seed parent in hybridizing, because the flower will still set viable seeds even though no pollination has taken place. When I told them that I have propagated thousands of *Z. grandiflora* from seeds, none of them believed what I said and told me that *Z. grandiflora* is

seed sterile. I insisted that my strain of *Z. grandiflora* is seed fertile and thus I claimed that I have a fertile strain of *Z. grandiflora*.

Everything became clear when I sent some bulbs of my "*Z. grandiflora*" to them. The flowers of my "*Z. grandiflora*" were evaluated and the conclusion is that it is not really *Z. grandiflora* and surprisingly, it is not known so far in the U.S. Its color is superior (darker) than that of *Z. grandiflora*. Dr. Thad Howard asked me to trace back the origin of this species (?) of *Zephyranthes*. I contacted Jack Craig and he told me he got some bulbs of this species from an orchid nursery in West Jakarta. Unfortunately, I could not go further as the land where the said orchid nursery was situated is now a large shopping mall claimed as the largest in Asia. Paul Niemi told me that since I have the largest quantity of this pink flowering *Zephyranthes* in my collection, I have a right to name it and suggested *Z. 'Fadjar's Pink'*.

I really do not have any idea about its origin, but I could just guess that it is a mutant of *Z. grandiflora*. *Z. 'Fadjar's Pink'* is true to type but its seed pod is not

I am really overwhelmed by the sight of this "blitz" of hybrid rainlilies. A big job selecting, uprooting, relocating, including self pollinating and cross breeding





From 3 "blitzes" in November 2005 we have harvested over 1000 seed pods of this red hybrid containing over 5000 viable seeds. Up until now cross breeding with this variety is aimed at getting deeper and larger reds. It is extremely prolific and sets suckers

plump like that of *Z. citrina* and the size of its seed is half of that of *Z. citrina*. A special characteristic of *Z. 'Fadjar's Pink'* which made it suitable as seed parent in hybridizing is that it won't set any seed if it is not pollinated by hand, and so far I have never found any flower of *Z. 'Fadjar's Pink'* which set seeds as the result of pollination by wind, because for an effective pollination it needs a relatively large amount of pollen. That is why together with one of my gardeners I could pollinate over one thousand flowers within a few hours, because we need not emasculate the flowers prior to cross-pollination. Unfortunately the color of *Z. 'Fadjar's Pink'* fades, but the color of the resulting hybrid with *Z. citrina* (which does not fade) does not always fade.

I have carried out my hybridizing activities in complete isolation in many years, wasting a lot of time by utilizing the apomictic *Z. citrina* as seed parent. I have tried to contact a few nurserymen in my attempt to purchase some species of rainlilies, but again I have wasted a lot of my time because none of them were willing to supply any.

When I joined the International Bulb Society and Bulb Robin, I put forward my difficulties in getting parent stocks. Paul Niemi, John Fellers,

and Dr. Thad Howard not only sent me bulbs and seeds of a lot of species and hybrids of rainlilies, but they also kept on enlightening me in my project. From Patrick O'Farrell of Argentina and from John Wagner, Dirk Wallace and Daryl Geoghegan of Australia I got some more bulbs and seeds of several species and bulbs of hybrids, and Alison Tiley bought for me a bottle of Surflan (Oryzalin) so that I could carry out an experiment for tetraploid conversion of rainlilies. Moreover, Karl King has helped me to publish the pictures of my selected hybrids and also created a website for me. Last but not least, Tony Avent of Plant Delights Nursery helped me by marketing some of my hybrids so that I could pay my gardeners to keep my project going on. So, it is not without reason that I feel I have received abundant Lord's

I prayed on the spot when I saw this beautiful red hybrid. The petals are round with a bright yellow center. This is my favorite among the reds and is of medium size



Some variations of “fully” double light pink hybrid. There is no pollen or pistil in this double hybrid so it is totally sterile. Medium size and it is an extremely prolific bloomer



blessings because He has generated so many friends who have helped me to make my dream come true.

Hybridizing is really interesting, because by so doing it we can bring something new to our world. We make the unavailable become available and our world will become even more convenient to live in. That is why in my opinion, hybridizing also means participating in the creation of the Lord. Moreover, I heard that in the U.S., rainlilies set flowers 2 years after seed sowing, but in my garden they set flowers just around 6 to 8 months after seed sowing. I cannot describe how happy I am when I get up in the morning and come into the garden to see thousands of flowering hybrid rainlilies and select some of them to be transplanted in special raised beds as my selected hybrids. I am re-

ally happy and enjoy life with these activities and such a kind of happiness could not be bought with any amount of money!

Being a weekend gardener, I could only maintain my garden on Saturday and Sunday as until now in my sixties, I am still working in a company to support my family. Therefore, in case I have “blitz” of flowers in workdays, I really do not want to lose any chance of hybridizing when thousands of flowers have appeared. So, if it is not rainy at night I have to cross-pollinate a lot of those flowers by utilizing a miner’s headlamp, sometimes until midnight - neglecting the advices of some of my neighbors not to do that as they believe that my garden is haunted! That is not what I am worrying about; what I am really worrying is about

poisonous snakes which sometimes can be found in my garden. Once a snake came into our bedroom at night and crawled on my chest. I thought that was a rubber snake jokingly thrown by my wife like she had done a day before, so I grabbed it and threw it back in the direction of my wife. I was so surprised that there was no reaction from her side that I switched on the lamp and saw



This semi-double does not look “neat”, but I like the new floppy characteristic with its combination of colors. It sets seeds, but only a few

that a real snake ran down from our bed!

Usually rainlilies set a lot of flowers 3 to 4 days after heavy rainfalls. In case after pollinating a few thousand flowers, suddenly we have a heavy rainfall, it could be a complete failure because the pollen is washed away by rainfall. To avoid this matter, if I have pollinated a lot of flowers during the rainy season, right after pollinating I cover the pollinated flowers with plastic glass used for packaging drinking water, supported with palm leaf stems, and take those plastic glass off the following day.

From time to time, I have learned a lot from my activities. I have found out that the appearance of the seed pods

we could harvest from a mother plant will depend on the pollen of which species we have utilized for pollination. For example, if you pollinate *Z. 'Fadjar's Pink'* with the pollen of *Z. citrina* you could harvest relatively small seed pods with small seeds, but if it is pollinated with the pollen of *Z. subflava*, the seed pod will become larger and plump with almost 100% viable seeds. Rainlilies will set a lot more flowers if the bulbs are divided from their clumps and replanted separately as individual bulbs. Also sometimes we have failed to get seeds from flowers that appeared in a clump, but if the bulbs from the clumps are divided, the flowers which appear later may start to set seeds.

Almost all my selected hybrids published in Karl King's website have the bloodline of *Z. 'Fadjar's Pink'* and *Z. citrina*. My reason for cross breeding both species is because I like to hybridize contrasting colors. I didn't think before that the result could

My first deep yellow with bright red picotee. Unfortunately, its petals are narrow. I hope improvement can be achieved soon as it could set seeds. The size of the flower is medium



My favorite gold and orange hybrid. The shape of its petals is beautiful and exclusive. Unfortunately my camera is too poor to capture its beauty. As it is a prolific bloomer and sets seeds I am utilizing it as a seed parent



An unusual golden hybrid with a yellow center. It is really eye catching with an extra long stem. Also a very prolific bloomer. Its flower size is medium to large. So far it has not set any seed although I keep on pollinating it

be so variable, such as multicolor, with many variations of yellows, reds, tans, pinks, picotees, stripes and even whites and some extra large (around 25% larger than the largest flowering species, *Z. grandiflora*). Moreover, the resulting shapes are also variable such as goblet shaped, flatly opened, wavy-edged, broad, narrow, crepe petal and doubles. From the beginning I have an obsession of achieving red and blue colored rainlilies. I did achieve red colored hybrids with a lot of variations but getting the blue one is still unsuccessful. Dr. John Mason, the great breeder of beautiful blue carnation, has helped me to observe whether necessary genes for blue color are present in *Zephyranthes*. However, unfortunately no blue colors are observed primarily as the pH in the petal cells is too low, and how to achieve higher pH is still not known. Maybe the only chance for me to get blue colored *Zephyranthes* is by carrying out gene splicing. However, with my limited know how and without any research laboratory which could support me, this is just a mere dream. Meanwhile I am also very much impressed by the achievements of the breeders of daylilies in the U.S. Maybe it will take tens of years until someone could do the same with rainlilies.

So far I have only utilized a limited species of *Zephyranthes* in my project. I do want to utilize species of *Habranthus* and *Cooperia*, but I have a problem

with *Habranthus* because certain species of *Habranthus* won't set any flower in the tropical lowland of Jakarta. I believe that the largest yellow flowering *Habranthus* is *H. howardii* which I have been looking for since a long time ago. Carl Schoenfeld of Yucca Do Nursery has kindly sent some bulbs of this yellow rare species to me, but it rarely sets flower in Jakarta and still I could not get any chance of pollinating the flowers of *H. brachyandrus* with the pollen of *H. howardii*.

As a matter fact, except for the enlightenment given to me by the above mentioned authorities in rainlilies, I have also got free consultations from time to time from Greg Hambali, one of my best friends and a freelance horticultural consultant. As I have no educational background in horticulture which could support me in my breeding activities (I studied law at the Parahyangan Catholic University, specializing in International Law & International Relations), I have never so far studied about hybridizing scientifically. I have just followed my instinct in choosing parent stocks in cross-breeding, while waiting expectantly that good results will appear.

So far assisted by my gardeners, I have cross-pollinated tens of thousand flowers of *Zephyranthes*. Maybe this could explain why I have got quite a lot of selected hybrids of rainlilies and there are almost around 400 of them. This will be added to from time to time with

newly selected hybrids. Because the flowers of the newly selected ones are much more beautiful than those selected at the early stage, I have to reselect among them for the less prospective hybrids and discard them because the space is so limited in my garden.

I have planted my rain lilies in 34 raised beds of 20m long and 1.1m wide in a piece of land of around 1,000m². In the rainy season the rainwater floods the ground between raised beds without causing any damage to the bulbs in the beds. So, there is no problem with heavy rainfalls, except that the weeds grow so prolifically that extra work to settle this problem is necessary. The soil in my garden is volcanic and it is very fertile, so that there is no need for heavy fertilizing, and I just fertilize it with cow manure to make it more porous.

In the past I have worked with Surflan and Treflan diluted with isopropyl alcohol and added with dimethyl sulfoxide which is commonly called DMSO for tetraploid conversion. However, I have stopped such kinds of experiment after getting a warning that it is too risky for my health. Oryzalin and trifluralin as well are highly poisonous and according to a report, DMSO could penetrate into our bodies so fast that within seconds after a drop of this substance gets contact with our skin, we will feel bitter taste at the tip of our tongues! I learn that the utilization of colchicine could be more effective in tetraploid conversion but with much greater danger as the toxicity of colchicine is much higher than the pre-emergence herbicides like Surflan and Treflan, because colchicine is highly carcinogenic and thus might cause lung or thyroid cancer. There are some other safer ways for tetraploid conversion including the application of paradichlorobenzene (PDF) and hydroxyquinoline, but in my sixties, time is running out for me.

I am very happy that in his website, www.bulbn-rose.com. Karl King has pronounced my hybrid rainlilies as Indonesian beauties, even though the habitats of rainlilies are very far away from my country. Therefore, in Indonesia we could never find rainlilies in the wild as the real habitats of rainlilies are in South and Central America and southern parts of the U.S. such as Texas, California and Florida.

Some foreign visitors to the above websites are so enthusiastic that they expressed their willingness to visit my garden which I could not accept, because the rainfall is beyond my prediction and I am unable to predict exactly when the rainlilies will set a lot of flowers. I just do not want to disappoint anybody else,



This bright yellow apricot hybrid is really eye catching. It sets flowers freely. The flower size is medium and it also sets seeds so it is good for cross breeding

but Marcelo de Oliveira of Rio de Janeiro, Brazil has managed to pay me a visit on his own risk. He was very fortunate that there was a “blitz” of rainlilies at the time of his visit and was amazed.

I do hope that my project could be continued by one of my children in the future, but unfortunately none of them pay any attention to what I am now doing. They do not even take a glance at the “blitz” of rainlilies in my garden. Apparently not all people are blessed with the ability of enjoying the sight of all the beautiful creations of the Lord. The usefulness of rainlilies for gardening lies in their mass application in landscaping (in suitable climates); otherwise they will only become collectors' items. Hopefully some time in the future, even after I have died, my hybrid rainlilies will be extensively utilized in landscaping, so that with more beautiful landscapes, life could be even more enjoyable for a lot of people.



My first narrow petalled semi-double ivory. It has no pollen at all, but I have not yet tried to pollinate it with the pollen of other cultivars

This is my best medium saffron yellow hybrid without any bronzing. I am going to propagate it for further hybridizing



Rainlilies belong to the amaryllis family and are classified in 3 genera: *Zephyranthes*, *Habranthus* and *Cooperia* though the latter is often treated as part of *Zephyranthes*. They get their name because they bloom in response to rain.



Fadjar Marta born Lee Ka Tjoen in April 17th, 1941 in the town of Bukittinggi, West Sumatra, Indonesia. Failed to study agriculture as his father did not agree to it. Enrolled at the Parahyangan Catholic University in 1962 where he studied law and majored in International Law & International Relations and graduated in 1970.

In September 1973 he married Liem Chiaw Yuen and has 4 children: Tessa (32), Selma (30), Sheryl (21) and Andros (19). When he was a child, he lived in the small town of Padangpanjang (West Sumatra) where his grandmother ran the only florist and plant nursery in town. This childhood experience has brought him to enjoy the hobby, love and passion for flowers and ornamental plants.



Birdseye view of my Rainlilies garden



Bulb Chipping *Haemanthus*

Jim Shields

I have been interested in the propagation of bulbs for some time. In 2005, I had the opportunity to experiment with the propagation of some *Haemanthus* bulbs. At the time, with the available facilities, the best method seemed to be chipping or cutting the bulbs.

Haemanthus montanus

Having received a good supply of mature bulbs of *Haemanthus montanus* from David Human in July 2005, I decided in August to experiment with propagating one. I used a bulb about 4 inches (ca. 10 cm) in circumference, and sliced it vertically into quarters. Each quarter-bulb was further divided by cutting horizontally through the basal plate. The lower or outer chip was approximately a twin-scale. The inner or core chips had much more bulk.

The chips were soaked in diluted Consan 20® (ca. 100-ppm after dilution) for 2 hours. The pieces were next soaked in ca. 0.5% sodium hypochlorite (household bleach diluted 1:10 with water) for 5 minutes and then rinsed in tap water twice.

Just before planting, the chips were soaked for 1



Haemanthus montanus core chips after ca 105 days



Haemanthus montanus bulb halved

hour in thiophanate-methyl (Cleary 3336®, ½ teaspoonful in 200 ml water).

Finally, the chips were inserted into 1 quart (ca. 960 ml) plastic food containers filled with moistened vermiculite, and the tops were sealed on. The lower or outer chips were put in one container, and the upper or core chips were put in a separate container.

The containers were held in an air-conditioned, heated room maintained at ca. 70–75°F (ca. 21–24°C).

Three and one-half months later, the containers were opened and the chips were removed from the vermiculite and rinsed. In each container, it was found that three of the four chips had produced one bulblet each. The bulblets grew in all cases from the basal plate tissue rather than from the bulb scales. The core chips in two cases had produced a root. None of the outer chips produced any roots. The yield at this stage was a total of 6 bulblets from a single bulb.

Haemanthus humilis subsp. *hirsutus*

In August 2005, I discovered that one of my mature bulbs of *Haemanthus humilis hirsutus* had suffered severe rotting of the basal plate. I attempted to salvage as much as possible of the remaining healthy tis-

sue. This amounted to about 8 pieces of bulb scales, without any basal plate remaining, and a couple of small pieces of basal plate with attached root.

The pieces were first soaked for ca. 1 hour in 100-ppm Consan 20[®], followed by ca. 20 minutes in 0.5% sodium hypochlorite solution. After rinsing in tap water, the pieces were finally soaked in thiophanate-methyl (Cleary 3339[®]; see above). The pieces were inserted in moistened vermiculite in 1-qt. containers, sealed, and held as above.

After ca. 90 days, green leaves were observed coming up from the vermiculite, so the containers were placed under fluorescent lights (40-W daylight type, 16 hrs. per day, ca. 6 inches/15 cm above the tops of the containers).

After a total of ca. 105 days, the containers were

opened and the pieces were removed from the vermiculite and rinsed clean.



Haemanthus humilis hirsutus chips

Seven of the bulb scale pieces produced one bulblet apiece. Each bulblet had at least 2 roots as well as one leaf at the time the pieces were removed from the vermiculite.

It was noted that only the pieces of bulb scale produced bulblets, and that no basal plate was left attached to any of the bulb scales. All the bulblets were produced from the bulb scale abaxial (outer) surfaces, never from the cut edges of the

scales. The fragments remaining from one mature bulb of *hirsutus* produced a total of 7 bulblets.

All the bulblets from both species were individually potted in 2 x 2 x 3 inch plastic pots in potting mix, and all were then placed under fluorescent lights at ca. 70-75°F (ca. 21-24°C).

Conclusions

Although the two different approaches to bulb chipping both produce roughly the same yield per parent bulb (6 or 7 to 1), the sites where the bulblets appeared were quite different between them. *H. montanus* bulblets grew from the residual basal plate tissue. *H. humilis hirsutus* bulblets grew from the abaxial surface of the bulb scales.

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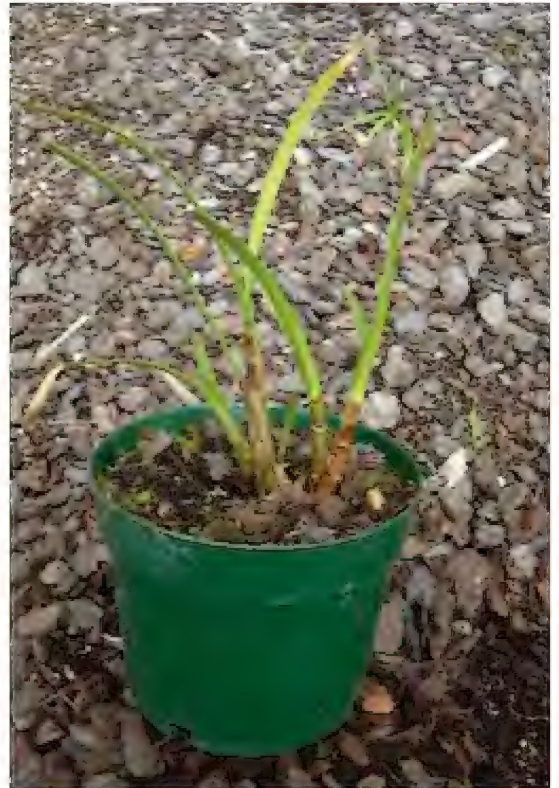
An unusual way of propagating *Worsleya procera*

Tony Palmer

Following on from the experience of Jim Shields with bulb chipping I would like to tell you of an unusual thing that happened to me with *Worsleya procera*. Although I don't find them particularly difficult to grow successfully, they are somewhat prone to narcissus bulb fly – one of the few pests or diseases that seem to bother them here.

Last year I noticed a 3 year old plant looking decidedly sick. I tipped it out of the pot and to my dismay there was unmistakable evidence that the bulb was indeed 'occupied' by a narcissus bulb fly larva. If it had been a common *Narcissus* I would probably just have destroyed the bulb and its lodger and moved on. But being a *Worsleya* I had to at least make an attempt to salvage it. So I used a sharp knitting needle up through the hole in the base plate and rummaged around in the bulb until I had impaled the hapless grub and removed it. Nowhere near as easy as it sounds and by the time I had got my prey the bulb was very badly damaged. It still had one or two healthy roots however, so I decided to repot it and just see what happened.

To my amazement after a few months several new growing points emerged around the remains of the now rotting original bulb. I have just recently lifted the pot and there were six very healthy new small bulbs which separated quite easily, each with some roots attached. They are now potted individually and looking good. It looks as though I achieved accidentally much the same sort of results that Jim did on purpose. I would never have dared to use bulb chipping as a means to propagate something as rare and precious as my *Worsleya*, but as a result of this fortuitous accident maybe it is something we should seriously consider in future. Anything that results in this bulb becoming more widespread in cultivation must surely be good.



Guidelines for IBS Members . . .

who would like to take part in the online seed and bulb exchanges run so successfully by Herbert Kelly

First let me explain that most of the offerings that IBS provides through its BX & SX, are extremely rare, elusive, and unobtainable anywhere else in the country. Twenty to thirty years ago, these botanical treasures were only available to a select few. We have made it convenient for the Amateur, as well as the Professional Botanist, to obtain these items at one convenient location. Without this service obtaining these treasures would come at a prohibitive cost. Listed below are Guidelines to help you use the IBS BX & SX, successfully.

- 1 DO NOT SEND YOUR DONATION UNTIL YOUR REQUEST HAS BEEN CONFIRMED
- 2 Please send your mailing address with every request. Your phone number would be appreciated also.
- 3 Please send your requests, *with the original subject heading that I've sent to the IBS forum, (for each bx or sx), each time.* Not doing so creates more paper work for me. Send this to me privately, NOT to The IBS Forum.
- 4 All donations must be sent to:

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- 1 ALL IBS MEMBERS PARTICIPATING IN THE BX & SX MUST KEEP THEIR ACCOUNTS PAID IN FULL, EVERY 30 DAYS, OR PRIVILEGES WILL BE SUSPENDED, UNTIL BROUGHT CURRENT. Payment can be made by Check, Money order or Cashiers check. Master card or Visa can be used, by contacting IBS Treasurer, Pam Kelly, at (559) 324-7676 or pkelly1668@aol.com
- 2 Many of the rare seeds and bulbs offered are in short supply, so unfortunately we cannot supply all wants, each time something is offered. We cannot list Bulb and Seed availability at convenient times to please everyone - as much as we try - in all Time Zones. Try to keep a watchful eye on the IBS Forum postings as it is first come, first served.
- 3 All material is shipped from us in fresh condition. Once it is delivered to the shipper, it becomes your property. We cannot be responsible for loss or damage. Donations are due once the package is shipped. There are no warranties expressed or implied.
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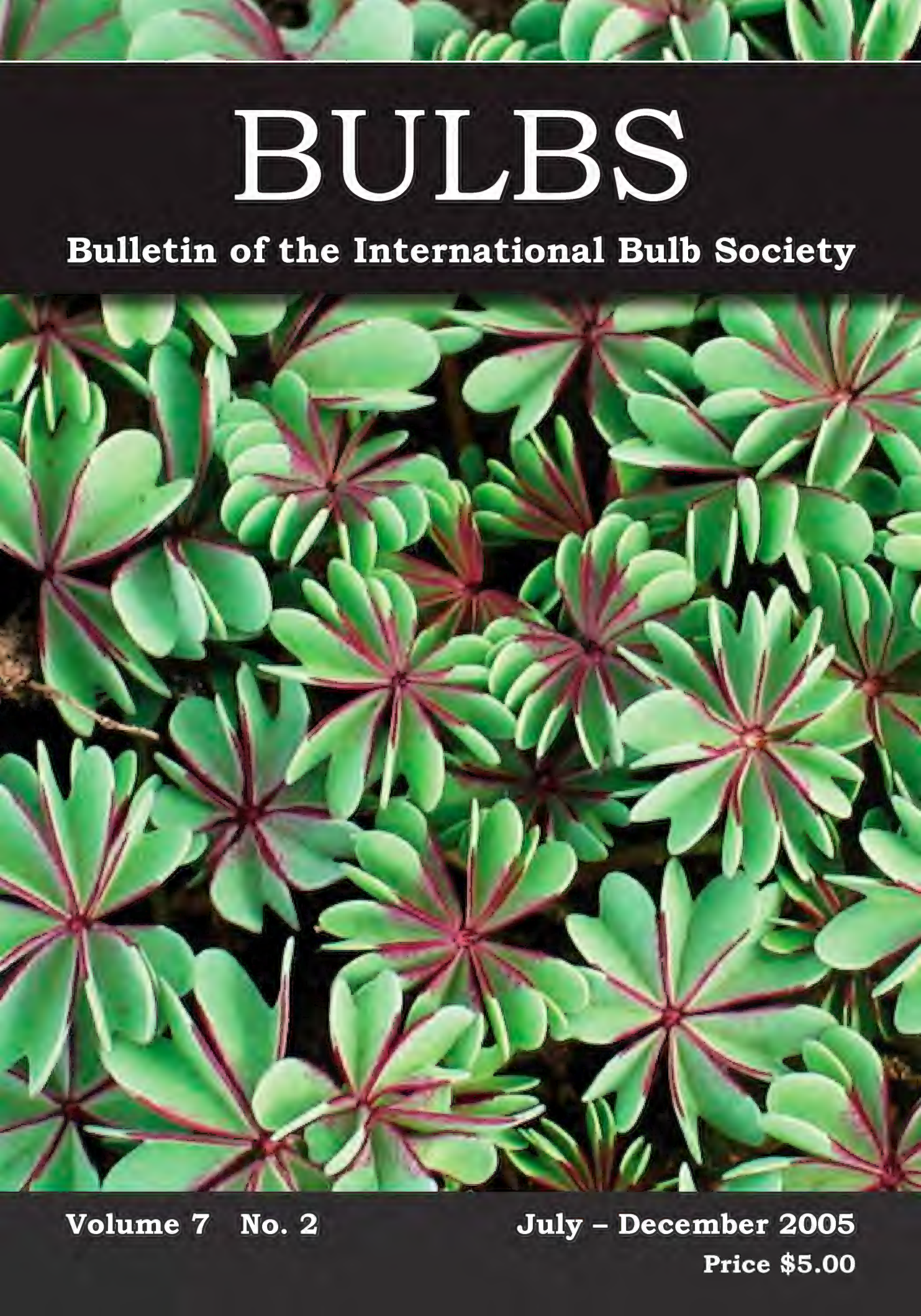
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COVER PHOTO

First Words

Tony Palmer – Editor



Truly an International issue this time, with articles from the United States, Scotland, Australia, New Zealand and South Africa. I would like to thank everyone for their response to my plea for more articles. I even have some in reserve, which is truly luxury! Many parts of the world have been battered by awful weather recently including my own city of Auckland, but somehow we seem to overcome these setbacks and our bulbs continue to bring us much pleasure.

Reading about them is a great way of relaxing and an article such as the one on Latvia and a visit to Janis Ruksan's nursery, by Sandy Leven, written in a truly evocative style, is almost guaranteed to kindle a desire to follow in his footsteps! Linked to this subject we have a book review of a recently published book by Janis, called "Buried Treasures", which is enthused over by Deborah Jordan. Other book reviews are of "Garden Bulbs for the South" by Scott Ogden reviewed by Mark Schusler and "Irises" by Claire Austin reviewed by Janet Matthews.

Graham Duncan revisits *Lachenalia sargeantii* which was reported flowering in 2005, thirty-three years after its flowers were last seen near Bredasdorp in 1971. The accompanying pictures reveal a very desirable species, but it is obviously not going to be easy to cultivate and flower even when seeds do become available. Rob Hamilton takes us on a very hot outback safari through South Australia in a successful search for native Crinum and Rachel and Rod Saunders, in the second part of their article on seed collection in South Africa, tell us what they have to do with all the seed they collect when they get them back home.

Last but not least, Jane Preston tells about her thriving nursery business called Bannockburn Floriculture in the deep south of the South Island of New Zealand. They specialise in the export of cut flowers of *Eremurus*, alliums and trilliums. Sadly we cannot grow the beautiful *Eremurus* in Auckland because we are just not cold enough.

Harold Koopowitz, well known to orchid and bulb fanciers, has asked me to reprint an invitation to IBS members and it appears on page 25. You may be sur-

prised to read that there are fall-blooming narcissus, investigate them; though small, they are fascinating, and most are intensely fragrant.

Some Forum Highlights

From Dave Lehmler about the floatation method of seed germination: Nothing special about my floatation method. Use a clean, clear 8-10oz drinking glass and fill about two thirds full with fresh rainwater. Float the seeds (*Hippeastrum*, *Zephyranthes/Cooperia*, *Sprekelia*) on the surface and cover the top of the water glass with Saran wrap (to keep out dust, spores, etc.). Then place the water glass on a southerly windowsill where it will receive direct sunlight during at least part of the day. Germination usually begins to occur within a week. The root like projection (I can't remember; is it the hypocotyl extension? Formerly called the radicle) will grow downward, and when it is circa 3/8 inch long, you can transplant to a pot or wait to transplant until the first leaf begins to appear. When transplanting, use a toothpick to make a small hole at the soil surface in which to place the root like structure, but keep the seed flat at the surface.

In 2006, there were seeds offered of *Hippeastrum brasilianum* on the SX/BX; I acquired a packet, used this floatation technique, and now I have a pot of seedlings. I've used this floatation method for >15 years; I can't remember who first informed me about it. It's not foolproof as occasionally the seeds don't germinate and this is accompanied by fungus growth. I have never tried adding fungicide or antibiotics to the floatation rainwater, but I suspect that it may have merit.

Robert Jenkins said: that he adds hydrogen peroxide (3.5%) to the water. It seems to help keep bacterial infection at bay and also keeps the seed afloat on the water's surface. **In reply to a further question from Jerry May** he said – "I add about a tablespoon of the household hydrogen peroxide (3.5% solution) to a pint (16 oz.) of well water. I change the water every other day, if not daily. The oxygenating action of the

H₂O₂ helps too, I think. I place the seeds across the top making sure there is only a single layer of seeds on the surface or less”.

Bill Warren observed and speculated: Tony Palmer’s damaged *Worsleya* bulb mirrors damaged hippeastrum bulbs that I have found to produce bulbils as the host bulb rotted from the locations that would have produced scapes. It is my belief that *Worsleya* contain embryonic scapes that would bloom much more often than they do, if we could find the procedure to get them to emerge. I believe that the same growing points in the bulbs between the layers produce both scapes and bulbil offsets as in *Hippeastrum*. Because of observations of *Hippeastrum* bulbs in Botanical Gardens last year where the bulbs were planted with about half the bulb above soil line but still exhibited 3 and 2 flowers per scape (large flowered “garden” type) because of mulching with a heavy tightly compressed layer of commercial mulch which they use to seal weeds in the soil made the bulbs feel (?) they were up to their necks in the ground. There may be a clue to more blooming of *Worsleya* here, but I do not have mature plants yet to test. (Grow faster, faster!)

Tim Eck asked: My *Clivia* fruit are turning red but the seed are still white. Should I wait for the seed to darken to harvest? Should they be planted

immediately? Stratified? Scarified? Advice greatly appreciated.

Rachel Saunders replied: Once the outer flesh of the *Clivia* seed has turned red, harvest the seed, clean the flesh off (the seed inside is white), and sow the seed on top of soil or leave it on damp paper in a warm place (covered with a transparent plastic lid. The seeds need warmth and light to germinate. Seeds need to be sown fresh.

Then In July the forum received a message from **Alan Meerow** formally announcing that he was stepping down as President of the International Bulb Society but will continue in his current role as Director of Science and Co-director of Publications as well as editor of HERBERTIA. We all owe Alan a debt of gratitude for having kept the Society going after the turbulent events of a few years ago. Alan went on to say that Dr. Mark Bridgen of Cornell University has graciously agreed to become President of IBS. “I have attached Mark’s biography to this email and have also inserted the text below. I can think of no one better than Dr. Bridgen to lead IBS further into the 21st century. He is an accomplished horticultural scientist and geneticist, with a huge vitae of work on geophytic plants. Many of you know him or know of his work. Mark promises to expand IBS programs, including a possible symposium again”.

BIOGRAPHY

Dr. Mark Bridgen – mpb27@cornell.edu

Dr. Mark Bridgen is a Professor of Horticulture at Cornell University and since 2002 has been on Long Island serving as Director of the University’s Long Island Horticultural Research and Extension Center (LIHREC) in Riverhead, NY. The LIHREC is the only Research Center in the United States that is exclusively horticulture and that has professionals who represent each of the major commodity areas (floriculture, ornamental horticulture, viticulture, and vegetables) as well as the cross-disciplines (entomology, weed science, plant pathology, and plant tissue culture).

Mark’s main areas of research are plant breeding, plant propagation, and plant tissue culture, especially with floricultural and ornamental plants. Some of Mark’s other research projects include the growth and evaluation of herbaceous ornamental plants and season extension for the production of field-grown cut flowers. Mark’s breeding program focuses on geophytes from Chile especially *Alstroemeria*, but also *Leucocoryne*, *Rhodophiala*, *Conanthera*, and *Zephyra*.

Dr. Bridgen has received several awards during his 25 years in academics. He is the 2008 recipient of the IBS Herbert Medal. Just last year he received the Academic Excellence Award from the Perennial Plant Association. In 1999, Mark was chosen as a Fulbright Scholar and has also received the Excellence in Teaching Award and the Faculty Adviser Award.

Mark is best known for his breeding work with *Alstroemeria*, the Lily-of-the-Incas. He has 6 plant patents: *Alstroemeria* ‘Liberty’, ‘Freedom’, ‘Patriot’, ‘Sweet Laura’, ‘Redcoat’, and this year, the winter-hardy cultivar ‘Mauve Majesty’ was released. The cultivar ‘Sweet Laura’ is the only fragrant cultivar in the world. Mark is breeding several bulb species from Chile to develop them for the horticultural markets in the USA.



Crinum Outback Safari

by Robert Hamilton

From 18th to 21st of January 2007 the native *Crinum* habitats in outback South Australia and the Murray River Valley received significant rainfall mostly in the 50 to 75mm range. Outback South Australia has an annual average rainfall of between 125 and 200mm (5 to 8 inches) while the Murray River Valley or Riverland as it is known, gets an annual average of 250mm (10 inches). So these rains were certain to stimulate the *Crinum* species present in these areas to burst into growth and flower.

I arranged to meet Jim Lykos in Adelaide three weeks after the heavy downpours experienced over much of central and eastern South Australia. We travelled into the habitats where we expect to find native *Crinum* species in flower. Jim had travelled through the Flinders Ranges and the Torrens – Eyre salt lake regions and Murray River Valley 12 months earlier with Dave and Nancy Lehmiller. There had been very little rain before the 2006 exploration trip and only a few populations of *Crinum* were located by their dry leaves. We were sorry that on this occasion Dave wouldn't be able to accompany us as he was still recovering from an illness.

Our aims were to find the distribution of *Crinum luteolum* around the Southern Flinders, and locate populations of another yellow *Crinum* variant that grow around the watershed margins of Salt Lakes in more arid conditions further north. We had hoped that this would allow us to judge the range of variation and status of these yellow species and to identify their habitat requirements.

Similarly we wanted to examine the hexaploid white flowered, amber budded, Murray River *Crinum* along the length of its South Australia Riverland and lagoon distribution and also to see if there were any

other unrecognized variants growing along the Murray River.

I booked accommodation for our first night in the mining town of Andamooka. After telling the proprietors of our reason for visiting they promised to look out for flowers. True to their word I received a phone call 10 days before we were due to arrive saying the "Andamooka Lily" as they are locally known were in full bloom. With the temperature 40°C every day for the previous week it seemed unlikely that any flowers would remain when we arrived. Our hosts agreed to take some photographs while they were still in bloom.



Desert *Crinum* at Andamooka, South Australia. Typical habitat.

I arrived by aeroplane in Adelaide at 12.45pm on Thursday 16th February to be met shortly after by Jim, who had driven from the Blue Mountains in NSW, which is a two day trip by car. The plan for the day was to travel the 580 km to Andamooka. We headed straight for Port Augusta. After 4 hours of travelling we took a short detour at Stirling North into Pichi Richi Pass to view the well known locality of *Crinum luteolum*. The severity of their habitat hit us as we

stepped out of Jim's air conditioned vehicle onto the hot stony arid ground that supported poor growing low salt bush. The nearby Port Augusta recorded a maximum temperature of 39°C on this day. There had been a very good flowering. There were still occasional flowers where plants were growing in the partial shade of the salt bushes but they were not at their best and some bulb leaves had already turned to dormancy. There was abundant seed production although it was not fully mature. We collected some seed and examined a sample of inflorescences for floral count, and measuring the length of the pedicles, scape, tepal tube and fruiting beak. We were to make the same measurements with most of the populations of crinums that we encountered on this trip as a basis for comparison.

undoubtedly measured in the tens and hundreds of square kilometres. We started seeing emus grazing near the road and, sadly, occasionally as road kill.

Near a district called Macleay which corresponded to the turnoff to the homestead of Oakden Hills station, we spotted a large population of *Crinum* in fruit. They were growing in red sand at a site where a temporary wash obviously occurs after rainfall. There were no flowers left to be seen but seed was abundant and more mature than the *Crinum luteolum* we had seen. There were some subtle differences in the appearance of these *Crinum* which suggested they were likely to differ from *Crinum luteolum* – and perhaps they were the “yellow desert *Crinum*”. My GPS told us that this was about 119km, “as the crow flies”, north west of the *Crinum luteolum* site we had visited and we were in a region of small salt lakes south west of Lake Torrens.

We continued north, ever alert, hoping to spot more *Crinum* populations in dwindling light and had to phone ahead to our Motel in Andamooka as it was clear, because of our delay exploring the unexpected site, that we wouldn't arrive until after dark. We arrived at 9pm. There were no street lights, but thankfully a couple of people drinking outside the local pub were able to point us to the motel which was almost totally in darkness!

Desert *Crinum* at Andamooka, South Australia. Typical habitat.

***Crinum luteolum* habitat Pichi Richi Pass, South Australia**

We continued on to Port Augusta and headed north up the Stuart Highway. We were now in real desert country. The predominant plants were small “salt bushes” and occasional larger acacias and shrubs that grew along the temporary creek beds we passed. Bare patches of sand and low dunes were now evident. We were now in areas of vast grazing properties. There were no fences just cattle grids on the road tens of kilometers apart marking the change of property or paddock which were



At breakfast the next morning we were presented with a CD with about 80 photos of the desert *Crinum* in flower. Jim had his laptop so we had a quick look at the magnificent photos before heading out to explore the area. It was already very hot at 8am – probably well over 30°C. We found the first population about a kilometre north of the town in a dry creek bed. There were numerous bulbs to be found in growth and an occasional flower. There was heavy seed production. Once again it was a sandy habitat, with saltbush and occasional larger shrubs near the now dry creek bed.

**Desert *Crinum*,
Andamooka waterhole.**

Andamooka waterhole.



We then headed further north and found a population around a waterhole which to our delight had many crinums coming into full bloom. They were growing in sand with a heavy clay component which was still moist and presumably they had their flowering delayed by being under water for some time. Close to the edge of the waterhole where flooding would have receded last, some plants were still in early bud. There were up to 6 open flowers on each inflorescence and colours ranged from bright to pale yellow, to white with a yellow centre which was variable in size and an occasional plant appeared almost completely white. We moved on and found a third site near the local airstrip – this appeared drier with little flowering. Some plants had leaves dried off or perhaps not even come out of dormancy. There was also evidence of rabbits feeding on the leaves. This site was at a higher elevation than the other two and supported large sand dunes with dry slopes with lush growing plants in the basins between the dunes.

The town was deserted as no opal mining is done in the heat of summer – it was 39°C the day we arrived and 40°C the day we explored the town surrounds. 40°C temperatures for days on end are common. It is as barren a place as you can imagine. The landscape was covered with myriads of steep pointed mounds of coloured sands which had been often hand excavated during the opal mining process over the past 80 years. The high mounds formed a colourful collage across the horizon.

After leaving Andamooka we headed north. At the mining site of the Olympic Dam mine we joined the Borefield Road. This road is unsealed and a huge sign at its origin had indicators about whether it and other roads further north were open. Basically when they get significant rain as had happened a few weeks before our visit, the roads are closed until they dry out, to prevent the clay based surface from being deeply rutted by motor vehicles. On the way north we passed an Arid Recovery site which had been fenced to eliminate feral cats. After this process is complete, endangered marsupial species will be reintroduced into the site. We drove past 10-12 km of high, well constructed, fine wired fence with reversed overlap above, indicating that the this recovery area must be huge.



Desert *Crinum*,
Andamooka waterhole.



Desert *Crinum*, Gregory Creek.
The cracked surface shows there was
standing water delaying flowering.
Photo taken around midday on a 42C day.

After about 100km of unsealed road we arrived at Gregory Creek. This was a series of now dry shallow channels several hundred metres wide. There were abundant *Crinum* here growing on the higher sandy banks amongst the channels. Most of the desert yellow crinums were carrying mature seed capsules on every flower. Occasional single flowers were still open and we found one with 5 open flowers. Later when looking at the photograph of this plant, the ground around this *Crinum* had a cracked surface indicating

a silt deposit and that it had been in standing water, therefore delaying flowering in a similar way as we saw at the Andamooka waterhole. It was 42C here, on the day we visited and no doubt several degrees more in the full sun yet these flowers showed no sign of wilting. Gregory Creek has a very large population of the yellow *Crinum* species and was quite green in patches from the growth of small annual grasses and desert annuals. Here we had our first real introduction to the local desert flies which absolutely covered our faces. Even insect repellent had no impression on their tenacity to fly into our faces and cling.



Desert *Crinum* habitat, Gregory Creek, South Australia. Typical sandy channel from the numerous ephemeral creeks at this site.

We continued north and reached the Oodnadatta track, the original road connecting Adelaide to Central Australia. We headed west on the Oodnadatta track to visit Coward Springs some 60km away. This is the site of a deserted railway station with an artesian spring that supports a series of ponds and winter camping area for bird watchers. However all the ponds had long dried out in the summer heat and showed no sign of its usually rich bird life and *Crinum* habitat. The heat and small flies were temporarily overcome by washing our face and hands in a permanent natural flowing spa. We then headed east towards Maree. The 120km was covered fairly rapidly on the unsealed, but smooth roads, but we had to be ever alert for the small washed out areas on the road at the site of temporary creeks from the recent rain. Maree, which derived its water supply from a mound artesian spring, was once a thriving town with a population of 4000 in 1981. It was initially the rail

head from which camel trains took goods into small settlements in the arid Australian interior, and from which cattle and sheep were freighted to Adelaide. After the railway to central Australia was removed to a new line the town declined to a population of 50 or so. It was 3pm when we arrived at Maree and we were ready for lunch but found it difficult to find anything suitable to eat at the small roadhouse. We settled for a milkshake and a “fresh” pasty which literally took ages to prepare as the roadhouse owners seem to have forgotten what to do and where to find the ingredients.

We then headed north to the Clayton River on the Birdsville track. This unsealed road is about 600km long and connects to the isolated town of Birdsville situated in the southwest corner of Queensland. We had read reports of yellow flowered *Crinum* growing at the Clayton River, so we were hopeful that we would locate this colony to see if the desert *Crinum* remained consistent from a different Salt Lake catchment region. Well there was no river but quite wide and dry water channels. We had no luck in finding *Crinum* as it appears this area didn’t receive significant rain and we would need to walk some kilometers along the creek line to a series of water holes. However, the ferocity of the heat in the open sun made only short treks possible. We saw no other vehicles on the Birdsville track and for the whole second day we travelled about 600km meeting only about half a dozen other vehicles. A group of wild donkeys provided some interest on the trip back to Maree.

After reaching Maree we headed south for Leigh Creek in the north of the Flinders Ranges where we intended to spend our second night. At Farina Creek about 20km north of Lyndhurst we spotted the yellow *Crinum* again spread among some quite lush grasses for a few hundred metres. These bulbs were in an advanced stage of seed production with no evidence of flowers. However it seems likely that the *Crinum* at Oakden Hills (Macleay), Andamooka, Gregory Creek and Farina Creek are all the same desert species.

We headed south from Leigh Creek early the next morning for Quorn and a second look at the Pichi Richi Pass population. The 200km journey was punctuated by stops to search the many creek and floodways, as well as examining some of the historic ruins along the old train line, but no *Crinum* were located on this morning. After just 2 days of extreme heat the seed of *Crinum luteolum* at Pichi Richi Pass was notably more mature. That ended our circuit of Lake Tor-

rens which was undoubtedly involved with other salt lakes in the distribution of the desert *Crinum* thousands of years ago in eras of a much wetter climate.

With a day and a half to spare before I had to return home we decided to head to the Murray Valley to see in flower *Crinum* aff. *flaccidum* (soon to be published as a new species) in those populations we knew of, and search for other populations to gain a better understanding of their distribution and habitat requirements. It was our aim to travel to the closest population at Blanchetown, by a route which took us through a number of small towns – Wilmington, Ororoo, Peterborough, Burra and Morgan. We had read a report of an old collection of *Crinum* (*luteolum*?) at Ororoo so we drove around to locate suitable environments around the town. We travelled to a lookout above the town in the water catchment reserve and

were surprised to find a population of *Calostemma* on a steep and very dry side of a hill. A few fading flowers remained and it appeared to be mainly a white flower with pink tips. Exploration of part of the creek line was fruitless and we didn't have the time to explore the steep sided hills and gullies of this reserve. The rest of the trip was relatively uneventful. At one stage we passed two sizable hills covered in grass trees but didn't see any more of this genus at any stage in our trip.

To get to Blanchetown we had to cross the Murray River by vehicular ferry at Morgan. Soon after leaving the ferry we found a large dispersed population of the white flowered *Crinum* aff. *flaccidum* with an occasional flower still evident. Some were very vigorous with 60cm flower scapes and some very large clumps suggested bulb division by splitting like *C. pedunculatum*. Blanchetown supported a very large population of this *Crinum* aff. *flaccidum* on a sand dune bank near exposed limestone cliffs bordering

one side of the river. Flowering was over and seed formation was well advanced. Light was fading so we continued on our way to Waikerie where we spent our third night. We arrived at 8pm having covered about 700 km over about 12 hours travelling.

We had heard of some *Crinum* populations around Waikerie but it seemed that a small boat was needed to get to them. Early the next morning we decided to have a look along the reserve foreshore to the west of the town where there were small sand dunes near the river. Deep grey sands seemed to be the preferred habitat of the Murray River *Crinum*. We soon found a small population not far from the river which was in between flowering and seed production. It was of interest when I returned home and reviewed the GPS reading I had taken at the site, to find that it was 13 metres below sea level.



Crinum flaccidum at Waikerie, South Australia with the Murray River in the background.

We then continued east to examine some *Crinum* sites that we knew of from Jim and Dave's 2006 exploration. At Berri the *Crinum* aff. *flaccidum* were not in great condition, already going into decline with what appeared to be poor flowering and seed production. The habitat looked very dry despite the recent rain and may not have received its fair share of rain a month earlier. There was a bonus at this site with reddish/purple flowered *Calostemma* growing in the same area and seed ready to harvest. It is interesting that two bulbous plants growing in the same habitat have such different growth patterns. *Calostemma*

flowers after the rain then remains in leaf through winter regardless of frost. *Crinum* produce leaves and flowers together after summer rain into autumn until conditions become too dry and winter also brings on dormancy.

From Berri we headed south on a loop of road to pass through the riverside town of Loxton then head north again to approach the small town of Moorook where we knew of a very small population of *Crinum* aff. *flaccidum*. The river is very much branched in this area giving rise to several very large lagoons. Yatco lagoon is east of the road on the approach to Moorook. About 1.5km before we reached the known population we spotted several *Crinum* growing on the edge of a citrus plantation, surely remnants of a larger population which had been destroyed by cultivation. We continued on and found another group about 800m before the known site and subsequently another 200m after the site. *Crinum* were on both sides of the road in one of these situations. It was surely a very large population before the road had been constructed through its range. There appeared to have been a reasonable flowering here, with plants in good condition and seed production in its early stages.

From there it was back to Blanchetown, and then we headed south towards Mannum gradually making our way closer to Adelaide. We chose to drive along the river road on the way to Swan Reach where we found 2 colonies of *Crinum* aff. *flaccidum* about 50 and 60 metres above sea level and a long way from the river, but growing in the typical sand bank situation it seems to prefer. The second colony was in a fairly level paddock which had clearly been cultivated and harvested in the past year, with the bulbs obviously too deep to be damaged. At the latter site some bulbs were in a much earlier phase of flowering so we were able to get some pictures. It was somewhat puzzling as to why there had been this delay. Time was short in Mannum and we didn't locate any *Crinum*. We did visit the waterfall site several kilometres from the town and found *Calostemma* in seed but the area had not recovered from the prolonged drought. From there it was back to Adelaide. My flight left Adelaide at 6.30pm but I had a long

transit time in Melbourne so I finally arrived home at 12.15am Monday morning. Jim had a day or two of rest and recovery in Adelaide visiting his family before tackling the 2 days driving to his home.

For a *Crinum* enthusiast it was an exciting 4 days covering 2500km of the harsh sparsely populated South Australian outback and the more populated but equally interesting semi arid Murray River valley. I can hardly wait until there is again heavy summer rainfall in South Australia to further explore the distribution of *C.luteolum*, and its similarities and differences with the Salt Lake/desert yellow *Crinum*. There are also crinums mentioned in the literature with flowers of mythical proportion and are there perhaps miniature forms on the coastal limestone soils yet to be found?



Robert Hamilton lives in Tasmania the island state of Australia at a latitude of 43° South.

I have had a long interest in bulbs, starting with those known to be happy in cold climates and gradually over 25 years expanding to include those from warmer climates, which are not necessarily easy to grow in my cold climate. I have had a concurrent interest in orchids particularly those of the Pleurothallid family and while now retired, I was once an accredited judge with the Australian Orchid Council.

I graduated in medicine in 1976 and have worked as a general practitioner since 1980. I am married to Vicki and share a hectic lifestyle with children Stephanie (15), Alexander (7), Katie and James (both 5).

IBS members who made cash donations to the various IBS funds during calendar year 2006:

Hajime Amagai • Rozann Brittain • David Ehrlich
Kirby Fong • Herb Kelly Jr. • Nickolas Nickou

Latvia

WHERE THE BULBS COME FROM!

by Sandy Leven

Latvia sits at the south eastern corner of the Baltic Sea with Estonia to the north, Russia to the east and Lithuania and Belarus to the south. It has been part of the European Union since 2004. Before then it was part of the Soviet Union. Latvia traded with the rest of Europe, including Scotland until World War II. It has a proud and complicated history. Geographically, Latvia sits at the centre of Europe. This comes as a surprise until you look at a map of Europe. Having lived in Scotland all my life, I have an old fashioned image of a Europe which stopped at the old 'Iron Curtain'. The EU now stretches from the Atlantic to the Black Sea and from the Mediterranean to the Arctic Ocean. There is a lot of Europe to the North and West of Latvia and truly Latvia is the centre of Europe – look at a map if you don't believe me! Until recently few Westerners visited the Baltic States. Now we have daily flights from Scotland to Riga, the Latvian capital.

History

Riga, the capital, is one of the ancient Hanseatic cities of the Baltic and Northern Germany.

Much restoration work has been completed in Riga and the buildings here are beautiful once more. The old town of Riga is compact and sits on the River Daugava. The city has many fine parks. The architecture is similar to that in Denmark, Sweden or Northern Germany. You would be hard pressed to find a more beautiful city, as long as you ignore the inevitable legacy of Russian rule, the apartment blocks at the edge of the city. Many traditional private houses, many apparently built of wood, remain in the suburbs and these are being restored. Riga is a fine place for a holiday base as it has traditional hotels as well as the 'modern' chain hotels. We however were not going to be living in Riga. We were driven one hour to the East to Cesis. The road was lined by woodlands of mixed deciduous and coniferous trees on both sides. Occasionally the forest opened up into rolling farmland.

Since 1940 the Baltic States had been occupied first by Soviet then by German and again in 1944 by Soviet troops. Only in August 1991 was the Independent Republic of Latvia re-declared. Latvians of my age have seen great changes during their lifetimes. They have triumphed over occupation and repression and are now free.

I have dwelt more on the past than I might have but a country is defined by its history. Just think of Scotland with its castles and mountains. Ours is a country in which we regale our visitors with tales of kings and heroes long dead. Latvians like Scots were and are a nation of traders and travellers. Both are small countries. Both are proud of their traditions and

national identity.

In Soviet times Latvia was the 'Holland' of the USSR. Latvia grew millions of tulips and daffodils for sale in Russia. Riga is only 8 hours drive from St. Petersburg (formerly Leningrad). It has road and rail links to Moscow, which are probably not used as much nowadays as they were before.

Janis Ruksans is a doctor of Biology and Horticulture and runs a bulb nursery in Rozula, Latvia. He has travelled widely in the former Soviet Union botanising and photographing bulbous plants in the Central Asian Mountains. In Soviet times he grew huge numbers of the daffodils and tulips for the Russian market and his expertise with these led to his interest in other bulbs. He was editor of the Latvian flower magazine 'Darzs un Drava'. He played a prominent part in the politics of Latvia in the final Soviet era and has been honoured by the Latvian Government for his contribution to the freedom movement.

He now grows an unrivalled range of bulbous plants in the nursery and has selected many fine forms of *Crocus*, *Tulipa* and *Corydalis*, often from his own collections. Since conditions in his own nursery are so extreme his customers know they are buying very hardy plants. His annual catalogue is packed with photographs, cultural advice and botanical notes. Janis lectures on bulbous plants in the UK, USA and throughout Europe.

Perversely it was probably because of Russian occupation and Latvia's membership of the USSR that Janis Ruksans was able to travel to parts of the former Soviet empire which have for years been out of bounds to Western visitors. Along with his friends he



Janis Ruskans on the right with Sandy Leven

has botanised in the Southern former Soviet Republics. He was able to collect and introduce new plants and good forms of known species. Because he is an expert grower, these introductions have thrived and are now offered to us to grow in our gardens.

I first heard Janis lecture at the Alpine Garden Society, Birmingham Bulb Day several years ago. I subsequently invited him to give two lectures to our SRGC Discussion Weekend when it was held at Stirling. After Birmingham, I sent for his plant catalogue from which I chose lots of treasures of my own. The bulbs arrived in superb condition, individually packed and labelled. This initial contact has led to friendship and visits. Coming from a trading nation, it should be no surprise to find that Janis is also a trader. In his case trade is in rare bulbs, the majority of which derive from his own introductions, breeding and selecting. Janis is a plantsman. He is a good cultivator and recognises a good plant when he sees one. Janis is a businessman. He set up bank accounts in the UK and Holland to make it easy for overseas growers to pay for his bulbs, so it is no surprise to find that one of Europe's foremost bulb growers sells to enthusiasts all over the world.

As I said, many of Janis' plants are from his own collections in the mountains in the southern former Russian Republics. It is amazing how well plants from these areas grow in Latvia, where they are quite close to the sea and that they also grow well in Scotland, although here I am guilty of growing too many in pots for fear of them dying outside. Janis is much more

sanguine. He grows the bulk of his outside expecting them to survive but if they don't, he accepts the fact.

Anticipation

Late in 2004 word filtered out of the possibility of a visit to Janis Ruskans' plant nursery at the end of April 2005. I was excited by the chance of going, and went on the trip with several friends from the Scottish Rock Garden Club and the Alpine Garden Society. Fred Hunt and I travelled with KLM via Amsterdam. Others went via London Heathrow. We met up with the rest of our party at Riga airport where we were welcomed by Janis and his wife Guna.

This was the start of an unforgettable weekend of plants, bulbs, history, architecture, culture, education, lectures, superb food, fine beer, hospitality and friendship. We were treated as family by Janis and his family and friends. Our base was the small city of Cesis which lies 1 hour east of Riga. We stayed in the small Hotel Katrina in Cesis. To my great joy and relief it had been completely renovated 3 years previously and all rooms had en-suite facilities. Our transport was a 20-seater bus and we had our own chauffeur (driver) for the weekend. Janis laid on a full programme, the social highlight of which he kept secret till Sunday evening.

Cesis

The historic city of Cesis is much smaller than Riga. It feels more like a big village or small town. It describes itself as 'the town of medieval romance' and celebrated its 800th anniversary in 2006. Cesis castle is the biggest in Latvia and dates from the 13th Century. It was the stronghold of The Knights of the Livonian Order. Unfortunately it is a ruin and has been since Ivan the Terrible laid siege to it in September 1577. It is a tribute to its builders that so much of it still remains after all this time. A huge statue of Lenin lies in a big wooden box in the castle grounds. It used to dominate



Cesis Castle

one of the town squares but has been replaced by the restored Victory Monument which was demolished on the order of the Soviet authorities in 1951. It was only restored in November 1998. Keeping Lenin just out of site is probably a good idea. He no longer dominates the town declaring Russian rule, but while he can be visited lying in his big box, he is there to remind everyone, Latvian or stranger, of the suffering wrought on the country.

taste it on several occasions to confirm its quality. On the Saturday evening we visited a Beerkeller where we took part in a buy two get one free promotion for the beer. The extra bottles caused much confusion as we had to take them into consideration when ordering our next rounds. We always seemed to get too much beer! After paying for one round I was given a packet of chewing gum as part of my change because the bar had run out of some coins!

While the staff went for supplies to replenish the bar, we Scots went out to explore the town. The streets were mainly cobbled and many houses looked like they must have looked in 1940. The Russians didn't do much restoration! Some buildings looked very drab and sad. Many houses are being restored and in a few years the town may be completely renewed. There is much to see and admire. The town is dominated by the 80 metre high tower and steeple of St John's Church, consecrated in 1284, 30 years before the battle of Bannockburn.



View of Cesis from our hotel room

We stayed in the Hotel Katrina in the town centre. It is an old building, restored and modernised in 2003. All rooms had en-suite facilities and the beds were comfortable. I was delighted to find that the electricity sockets were standard European style and that my adaptor fitted. I was able to charge the batteries for my digital camera. The staff could not have been friendlier. English is taught in schools and just as we were leaving a party of children came to try out their English on us. I think our Scots accents confused them! Menus and information boards are written in Latvian and English and sometimes Russian as well. All the staff spoke some English. The food was good and well prepared. On our first evening in Cesis while we ate our first fine meal, we managed to consume all the beer in the hotel! I had never been party to drinking a bar dry before! Like good tourists we drank the local beer, the famed *Cesu alus*, claimed to be the oldest brew in Northern Europe. We felt obliged to

The first plant I noticed was a small *Scilla sibirica* just beside the hotel. Close to it was a solitary double snowdrop. I think these were growing in what had been a garden, whose house had long since disappeared and they were not truly wild. The stone here is dolomitic limestone and it has been used in many of the buildings. In the grounds of Cesis Castle and on steep banks under lime trees we were delighted and I must admit to being surprised to find swathes of *Eranthis haemalis*, *Corydalis solida*, *Anemone ranunculoides* and tiny *Gagea minima*, appropriately nick-named 'least Gagea'. I had never seen so many 'wild' *Corydalis* and the *Gagea* was new to me. The *Corydalis* were uniformly a pale bluish purple but were a foretaste of finer things to come. In the daylight we saw that the colour varied from quite blue to pink. The *Anemone* had small rich yellow flowers and grew individually and in clumps. I had seen yellow clumps growing beside the main road as we drove to Cesis and once I saw



Marked seedlings of *Crocus*

the *Anemone ranunculoides* I realised what the clumps were. The *Gagea*, as its name infers has small yellow flowers. They are grouped in three or four on a loose umbel (if this is the correct name) beneath which are two opposite, stem leaves. It has a single basal leaf. By itself it is not worth crossing the ocean for but there were hundreds of them, lit up by the evening sun and when seen with the other yellow flowers, the effect was magical.

On our way back to the hotel we passed the Russian Orthodox Church of the Epiphany of Christ, a beautiful small white Byzantine building with two domes, built in 1842. The sun tinged the dolomitic limestone walls a soft pink colour. It looked as if it had just dropped from the film *Dr Zhivago*. For religious completeness I will tell you that in Cesis there is also the Roman Catholic Church of Christ the King. It has a wooden spire and a maroon roof and dates from 1928, by which time there were enough Roman Catholics in Cesis to merit their own church.

Guna gave us guided tour of the town and castle on Saturday morning. The lawns in the castle grounds were studded with pale purple *Corydalis solida* on which the dew sparkled in the bright morning light. Although it was the end of April the trees were still bare and plenty of light reached the emerging *Corydalis* flowers. Presumably, the flowers have seeded and the foliage died back before the grass is cut. Daumans Kalnins is a jewellery smith and applied artist. He has researched and studied the archaeology of Latvian jewellery and ornaments and he casts replicas to sell to visitors. He demonstrated his craft and showed us many examples. Most of us bought one

or more brooches or trinkets to assuage the guilt of travelling without spouse! All of us knew more about Latvia and its history than ever we expected. Janis thought it was now time to get to the plants and sent the bus to collect us from the castle. The journey to his nursery at Rozula took us along the River Gauja valley and out into the countryside.

Nursery

Janis Ruksans' bulb nursery covers several acres of undulating land, with its own pond and woodland. He has three big high poly tunnels and a huge packing shed beside a lovely modernised house. When we were there, it was warm, still, and the sun was shining. Spring was in the air but during winter Janis told us that frost can penetrate more than 1.6m into the ground, hence the poly tunnels to give a little protection to some fritillarias, iris and selected tulips. All the corydalis, which were the plants I most wanted to see were planted outside in rows like potatoes. Over winter they are covered with a thick layer of peat for protection. True to form our visit started with our choice of home made apple juice, coffee and biscuits. Janis and his friend Dr Arnis Seisums then delivered two lectures. Janis, also a Dr of Biology, chose 'CROCUS' as his subject as he felt we had missed seeing many of them as they flowered earlier in the year. His catalogue lists 78 different species and forms of *Crocus*. He grows many more than that as not all are offered each year. Arnis talked on 'JUNO IRISES' many of which he grows superbly in his garden in Riga. We would visit them the next day. Both Arnis and Janis have botanised in Southern 'former USSR'.

Lunch followed and again we were treated to a



Corydalis solida rows

delicious selection of cold meats and salmon with wine and apple juice. As they say 'it was just like being at your Auntie's'. After lunch we were free to wander wherever we wanted through the nursery. It is meticulously tidy and organised. The various aspects allow him to choose the ideal situation for any bulb, from Poly tunnel cover, south facing or north facing depending on how frost resistant the flowers are. Janis guided us through the different places and smiled as we enthused over the wonderful bulbs. He is a very modest man but one who obviously knows more than most about his plants. Everything is labelled, though the labels are buried and always at the same place beside the bulbs so that he can quickly find any name. When he lifts the bulbs he is meticulous in taking only those in the rows and not errant seedlings. I get the feeling that he rotates his crops from time to time because one empty area had lots of different single *Corydalis solida* scattered around.

As soon as we left the bus we spied some pink

flowers near a house gable and being typical rock gardeners, we wandered away from the treasure filled poly tunnels to see what was growing in this north facing bed. To our delight the pink flowers were *Erythronium sibiricum* and they had huge flowers with fully reflexed petals. Beside them were rows of the white from of *E. sibiricum* named 'Altai Snow'.

The first plants we looked at in the tunnels were a series of fritillarias. I am used to seeing special fritillarias growing in pots and was interested to see them thriving here in raised beds. These were edged with board anchored with angle iron to give a planting depth of 20cm above ground level. The compost mixture looked to be very open with a lot of peat and sand in the mix. The bulbs were planted quite deeply. The tunnel was divided by a central pathway and further subdivided into side beds separated by access paths. It was possible to see everything without stepping on the beds. Water, pumped from the wee loch on the nursery, is delivered to the plants via trickle pipes laid on the surface, spaced about 25cm apart.

Many frits were past but some we could admire were fine forms of *F. whittallii* from a collection made in Akseki in Southern Turkey and what I took to be *F. nigra*. I think we all stopped to admire a large clump of *F. verticillata* with large white greenish tinged flowers. This



Erythronium sibiricum



Erythronium sibiricum 'Altai Snow'



Fritillaria whittallii

was the clone called 'Kara-Sumbe'. Kara-Sumbe is a valley in the southern Altai Mountains in Kazakhstan. We had not seen the last of the fritillarias as many more are grown outside in 'the field'. Next to the frits was an anemone which I did not recognise. Mind you there was nothing unusual about my finding a plant new to me or whose name I had forgotten. I felt better when I realised that Fred Hunt, Chris Brickell and

Joy Bishop also found plants new to them. This first unknown was a yellow flowered *Anemone eranthoides*, so named presumably because of the red reverse to the petals. The amount of red seemed to vary and the flowers resembled tiny tulips before they opened and they had nice, very divided leaves.



*Anemone
eranthoides*

Muscari muscarima
'Honaz Dag'

*Muscari muscarima
ambrosiacum*

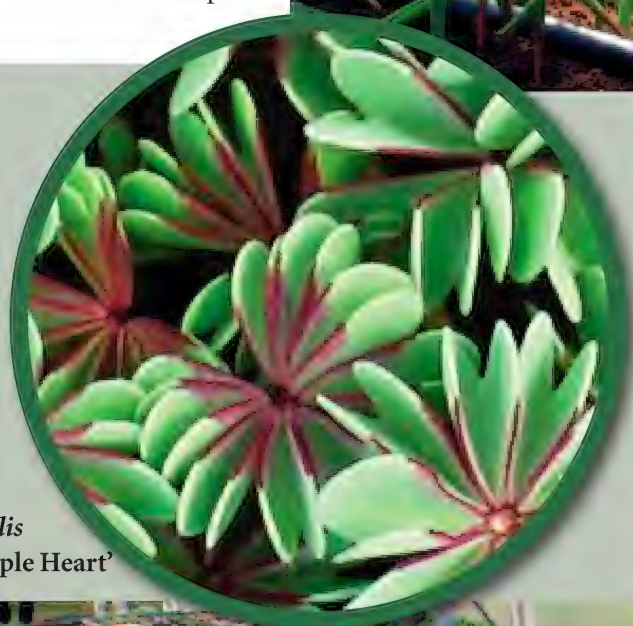
Close by, was a fascinating bed of *Muscari muscarima*. This is a fine plant with strong stems supporting a large heavy head of pale cream or muted grey-blue flowers. There are probably about 50 tiny flowers on each stem and every one has a puckered mouth. The mouth colour seems to be pale blue on unopened flowers and changes to brown on the more mature flowers. This changes the appearance of the flowers as they age and makes clumps of variously aged flowers interesting. I particularly liked the clones marked 'Creamy White' and 'Honaz Dag', both with cream flowers but the latter started smoky grey. Another fine form bore the name of Rod Leeds, Chairman of the Joint Rock Garden Plant committee. Who would have thought of waxing lyrical about muscaris?



'Purple Heart' is the name given to a particularly fine foliaged form of *Oxalis adenophylla*. It is more dwarf than the usual form of *O. adenophylla* and has an exquisite purple base to each glaucous leaf giving each a 'purple heart'. I fancy a show exhibit of *Oxalis* 'Purple Heart' and *Trillium* 'Purple



Tulipa aucheriana



Oxalis
'Purple Heart'

Heart' would be interesting!

Janis raises untold numbers of seedlings and has his own technique. Where we might sow small amounts in pots, or sow larger amounts in polystyrene boxes, he uses the deep plastic Dutch bulb boxes. The box is lined with black polythene and filled with compost. Boxes are lined out in a poly tunnel. Janis says one advantage is that the boxes being uniform in size are interchangeable so that he can move them around when necessary with a major re-shuffling of the entire tunnel. The seedling bulbs can stay in their box until they are big enough to plant out. They are less likely to suffer frost damage as they can go deep down.

The next tunnel was much more colourful as it was devoted to tulips and irises. Across the width of the tunnel were 10 or 12 rows, raised up like potato drills. Dark, peat rich soil



Seedling boxes



Iris graeberiana
'Yellow Fall'

Tulipa humilis albo-caerulea

suited these treasures. Janis uses a lot of peat (because there is a lot of peat in Latvia and Russia) to protect the bulbs from the vicious frosts. Remember winter lasts a lot longer in Latvia! Janis offers nearly 50 different tulips for sale. He had a breeding programme in the 1970's using *T. vvedenskyi*. They are colourful plants with big flowers on stocky stems. One of my all time favourite flowers is the blue centred tulip, *Tulipa humilis albo-caerulea*. This is often seen at shows but a row of them in full flower was special! As well as the combination of white petals and dark blue basal blotch, the flowers have jet black anthers and a pink stigma. A truly fabulous bulb.



Seedling *Corydalis* rows

I think of Juno irises as difficult plants. The secret to success in growing them seems to be to plant them in a poly tunnel in Latvia. Janis had them lined out like leeks in the same type of beds as he used for the tulips. He grows an enormous range of species and types, only some of which I recognised. One fine row was of *Iris graeberiana* 'Yellow Fall' which won a Forrest medal for Cyril Lafong at an SRGC Stirling show a few years ago. These plants would have to be entered for a class of '1 Row iris distinct'! Juno *Iris* species flower over quite a long period and we saw only some of them. Another row was of *Iris nusariensis* with which Lionel Clarkson won a Forrest medal in 2005 at Blackpool. I mention these successes to show that these fabulous iris can be grown successfully here at home.

A Rainbow of Corydalis

When we left the last tunnel and turned to look at the beds outside we could hardly believe our eyes. Row upon row of brightly coloured *Corydalis solida* forms resembled a rainbow which had fallen to the ground. You felt like taking pictures here there and everywhere. Closer examination showed that the varieties of *C. solida* were kept together in their own bit of row and that each was identified with a buried label. Janis lifts them in summer, grades them, sells some and then replants them in autumn. During winter the rows are covered with a very thick layer of peat. Still they must be very hardy because the frost can penetrate 1.3m into the ground. I think here in Scotland frost

penetration is reckoned to be about 75 cm (20 inches). As the labels were buried it was difficult to know which variety was which. Janis pointed out some of his favourites and we asked about all the others he did not mention! With the *Corydalis solida* forms Janis has a continually evolving breeding and selection programme. He raises lots of seedlings every year and selects special plants to grow on. Susan Band and I really liked some of the new bicoloured red and pink flowered forms. You could choose between red flowers with white lips or white flowers with red.

In his recent list Janis has given names from the Lord of Rings to his best new plants. You would have to get both 'Frodo', white with purple lips, and 'Gandalf', white with a



Corydalis marshalliana



Corydalis solida



blue rim. 'Falls of Niodel' he says is "slightly orange toned, reddish pink spur and almost pure white lower and upper petals". It sounds unique. 'Mordorland' appropriately is one his darkest *Corydalis*. In my first order I asked for a mixed lot of 'Penza Strain' corms and received corydalis in several shades of pinky lilac but amongst them was a white seedling. The Penza bulbs have the advantage of being cheap, so it is worth asking for some if you order. We were shown the new 'Penza Strain' seedlings and some looked very fine. Imagine if you ordered 10 and got 10 different colours! *Corydalis solida* flowers in Scotland in early spring. There are usually large numbers of them at the Blackpool or Edinburgh shows. When you see them, you will realise just what terrific value they give. All these colours and combinations have been arrived at by cross breeding and selecting plants in cultivation. Many would look out of place growing wild where the muted colours seem more appropriate but as a garden or pot grown plant for early spring flowering they are hard to beat. Only *Crocus* comes close to them for variety and combination of flower colour

Curiosity was the only thing which dragged me away from the rows of fabulous *Corydalis*. As the nursery covers several fields, exploration required a bit of walking. Outside I found long rows of *Fritillaria eduardii*, *F. raddeana* and several different *F. imperialis*. These were literally growing in rows in a field and you never saw finer specimens. In another area was a fine clone of *F. aurea* with large egg sized golden flowers. Close by and slightly damaged by a frost were



Fritillaria aurea



Fritillaria latifolia nobilis

clear of the foliage. *Fritillaria alburyana*, *aurea* and *latifolia nobilis* are among the most fabulous of all bulbs and here they were, thriving in a drill on a south facing field up here at Rozula.

Before we left Rozula we had to make sure we had seen all that there was to see. This is how we discovered another pond. This pond was supposed to be a drainage ditch but a beaver had worked away and had managed to dam the ditch, forming a long thin pond. As we travelled around Janis pointed out areas of water in the woodlands. These too, were flooded areas caused by beaver dams. He told us the trees would die and that the beavers could be quite a pest. At four or five in the afternoon we left the nursery and headed for 'lunch' as it had been billed on the programme.

'Lunch' turned out to be a banquet at a fine restaurant built beside a lake. You would go far to find a better meal or better company. Platters of cold of meat and fish with salads and bread and with beer and wine to start off, while the chef prepared our main courses. Salmon, beef, veal or pork were on offer, prepared to traditional Latvian recipes. Latvian food is good, even in the Airport café. Towards the end of the banquet when we thought we were going back to Cesis we were joined by a Livonain Knight, his Lady and Princess. Through our interpreter Guna we were told a lot about the Knights of the Livonian Order who ruled the land for hundreds of years. In recognition of his status in the world of horticulture Chris Brickell was asked to swear an oath of allegiance of some sort and is now a Knight

strong plants of *Fritillaria alburyana*. The leaves were undamaged and the *F. aurea* was untouched by the frost. A short row of *F. latifolia nobilis* caused an intake of breath. The flowers opened at soil level and over the next week or so the stems lengthened to lift the flowers

himself. Various rights go with the privilege but his Lady Jean will keep an eye on those! After a splendid day, it was back to Hotel Katrina and thence to the Beer Keller in Cesis where we were to be confused by the buy one get one free offer.

Turaida and its Rose

On Sunday we were lucky enough to be able to visit Arnis Seisums' garden but before that we had another castle to see, the Turaida Castle at Sigulda. This edifice sits atop a tree covered ridge above the river Gauja. It is built in red brick and although it was ruined much has been and is being restored.



Amber Necklaces

I lost the whole party by being a good tourist. The bus parked. I spied a celandine in a ditch; went to look; came back to car park; saw the locals with their craft stalls; admired the amber jewellery; talked to the sellers; bought some; spied haematite jewellery; bought some; looked at walking sticks; didn't need one; where is everyone? I made my own way towards Turaida estate. Entry to the castle is via the Song Park. Folk Song Hill has many granite sculptures representing aspects of folklore and history. Our guide told us the poignant story of The Rose of Turaida. It is Latvia's version of Romeo and Juliet but the baddies were Polish. The Rose of Turaida was an honest and loving girl who chose to die for the sake of love instead of losing her dignity. The villain committed suicide and went to the devil. It is not a happy tale! Newly married couples come here and lay a rose flower on her grave to support the notion that love is stronger than death. Every year there is a rose festival at Turaida.

It was not roses or lovers which caught my eye that

Sunday morning. With the dew still on the ground the lawns were pink with the flowers of multitudes of *Corydalis solida*. They grew as daisies in the short turf. Once again I was on my hands and knees photographing these wee beauties. They were mainly purple or rose in colour and varied in shade from light to dark. Fred and I found at least two white ones. At only a few centimeters tall they were quite magical. Amongst them were a few cowslips, *Primula veris*. By this time I had missed most of the story of the Rose of Turaida! Still we all met up in the wee church where I bought a book about the story of the Rose.

There were several other plants in flower to distract us from the sculptures. Down a steep slope a patch of chrome yellow beckoned. Charging downwards I found that the slope was exceptionally muddy and the chrome yellow *Chrysosplenium alternifolium* was growing in a bog. *Anemone nemerosa* grew in drier ground and the little *Gagea* reappeared. Robert Burns wrote of the 'wee crimson tipped flower'. The daisies at Turaida were the reddest I had seen, excluding the bedding plants favoured by local authorities.

The photographers caught up with the rest of the party at the sculpture park. The sculptures were carved by local artists from granite, glacial erratic boulders. They are set on the grassy ridge of the park surrounded by grass. The overall shape of each sculpture is determined by its boulder. On those which I found most distinctive the carvings on each side folded into each other. A Latvian favourite is that of an old man deep in thought, called 'The Song Father'. Across the song park a steep, twisting, narrow path which led down into a dark precipitous valley and finally up to the Turaida castle on the ridge. For most



Turida Church with *Corydalis solida*



Anemone ranunculoides with *Equisetum palustre*

of the time we were in the valley, the castle was hidden by trees.

Springtime in a deciduous wood is a magical time. The trees are still bare but plants are bursting out of the ground and flowers are everywhere (if you choose the right wood!) Turaida woods are part of the wider woodland of the Gauja river valley. Most of the trees are deciduous and they have a rich carpet in April. The entrance to the wood was guarded by a big patch of *Anemone ranunculoides* with all around new spears of mare's tail, *Equisetum palustre*, poking through them. The *Equisetum* likes damp ground so these woods are probably moist all year round. *Asarum europaeum* is a low evergreen plant widespread in Scandinavia and Holland and maybe native to Scotland. In the wood litter its straggling stems with their shiny kidney

shaped leaves wandered through other plants and sometimes made quite big patches on its own. The hairy brown flowers are borne on even hairier stems. White *Anemone nemerosa* flowers were just opening reminding me of home but here it was accompanied by *Corydalis solida*. In the deepest part of the valley, growing through rotting wood was a parasitic *Orobanche*. Its dark purple stems were just opening and it looked quite sinister.

Eventually we climbed out of the 'gorge' and up to the castle. Turaida castle is being restored. It is built of thousands upon thousands of red bricks. We learned more of the Livonian people but the star attraction for me was the discovery of two coats of arms for Graf von Lieven and one for Baron Lieven. I intend to pursue this, especially the Russian line and if necessary I will change the spelling of my surname. A coat of arms featuring a red shield with seven golden stars and three golden Fleur-de-lis topped by a black double headed eagle would look well above our fireplace!

Arnīs Seisum's Garden

After a superb lunch which cost the equivalent of £5 per head including beer we returned to our hotel to put on our good clothes. Janis had told us to bring some dressy clothes because we were going to the opera house in Riga on Sunday evening. We were very well turned out for rock gardeners on a garden weekend. So the ladies took more than one pair of shoes each! Arnīs lives in the suburbs of Riga. He has a large garden compared to the average Scottish garden but



Fritillaria eduardii



Arnīs Seisum



White 'n red *Tulipa kaufmanniana*

we were not prepared for the huge range of rare bulbs which he grows. He had talked to us about Juno irises but did not prepare us for the sight of them growing in rows in the garden. Some were given the protection of a poly tunnel but most of his bulbs grew outside in the garden. His frits and corydalis are grown in raised beds and he does give them some protection with peat over winter. He has collected several fabulous forms of *Tulipa kaufmanniana* on his travels in the USSR. They gave a bright splash of colour near the entrance. Behind them were the fritillarias. A row of more than forty *Fritillaria eduardii* in flower dominated the bulbs. Strong plants almost a metre tall, their flower colour varied from light to dark orange. Beside them the most fantastic clump of *Fritillaria gibbosa* radiated



Fritillaria gibbosa

health. Sturdy stems holding ten or more pink flowers each with large nectaries. *Fritillaria bucharica* was just as impressive. He grows a tall form of *Fritillaria sewerzowii*



Fritillaria sewerzowii

zowii with wonderful light green flowers. Members of the Fritillaria Group drooped over the short row of the tiny yellow *Fritillaria minuta* from Turkey. In England, where it is grown in pots, it is a shy flowerer. Now I know what it should look like.

Arnis and Janis both like Pushkinias. To be honest I had not thought much about them but when you get down and really look at the flowers they are beautiful. I think I had better order some, in case they become the next 'must have' plant. All the *Anemone ranunculoides* we had seen growing wild had plain green leaves. Arnis has a form with a deep red colouration at the leaf bases. This adds considerably to its beauty. When all the Juno irises come into flower Arnis' garden must be a sight to behold. Before we left it was



Multi-headed *Tulipa bifloriformis*

tulips which once more attracted me. This time it was the multi-headed species, *Tulipa bifloriformis*. It starts to flower near ground level and as it ages the stems come up to reveal several tiny tulips in a bunch. Yellow brown and pink forms grew side by side. The sun was still shining bright as we thanked Arnis for showing us his garden.

It was now time for the cultural highlight of our visit. Unknown to us, the weekend of our visit coincided with the first anniversary of Latvia and the other Baltic countries joining the EU. We were delighted when Janis told us that he had bought tickets for us to attend the 10th International Baltic Ballet Festival Gala in The Opera House in Riga. This was the official celebration of the 1st Anniversary. We, along with the other celebrities in the audience, were welcomed in English and Latvian by The President of the Latvian Republic, Vaira Vike-Freiberga. The mayor of Riga, Aivars Aksenoks, then welcomed us to Riga praising it as a 'European cultural metropolis'. The National Opera House is a big white building with a façade resembling a Greek temple. Everyone was dressed in their best clothes (just like theatre here used to be). Fred and I refreshed ourselves with a Cognac, coffee and a slice of gâteau. No beer at the Opera House! The dancers came from Spain, Austria, the USA, Korea and Japan as well as Latvia. They were outstanding.

By this time we had become much 'better acquainted' and on the bus journey back to Cesis we chatted about all the wonderful plants and dancers we had seen over the weekend. We returned to our hotel at well past 11.00pm and were welcomed back by our receptionist. She had stayed specially to serve us with a light supper which we were sensible enough to have ordered earlier. Once again we enjoyed our Latvian cheese, salad and bread, served of course with a glass of Cesis beer. The next morning we drove to Riga to catch the plane home. Fred and I had only a very short time to see part of the old city. Red and green roofs, stone towers and brick towers and houses with ornate painted facades and beautiful old churches are packed together in the compact old town, sandwiched between the River Daugava and a large park. Modern hotels offer every comfort. Street traders selling all sorts of Amber necklaces, bracelets and brooches stand politely as you wonder which to buy. Latvia has always been famous for its amber. For me it is synonymous with friendliness, hospitality, fine food, wonderful castles, ballet and especially wonderful plants. I hope I can go back very soon. There is much more to see. Our weekend was arranged by Janis and Guna. They packed so much in for us. They never hurried us. They were perfect hosts. Although we were there for only a long weekend we felt we had had at least a

weeks holiday. I am glad I was a good tourist and that I brought home some souvenirs. I now have to order some more bulbs from Janis. I don't know where they are going to grow but he has so many treasures in his list that I can't resist.

In spring 2007 Janis came to Scotland and gave two lectures at the Scottish Rock Garden Club's Early Bulb Day here in Dunblane. The hall was packed with enthusiasts who had waited for more than a year to hear him. He was supposed to talk in 2006 but broke his leg and could not travel. Many of the slides he used and the plants he described are included in his book, 'Hidden Treasures'. He spent much time looking at plants in the display and chatting to members. While he was here he visited several gardens which he wanted to see : those of Susan and Jean Band, who hosted him, Fred Hunt, Margaret and Henry Taylor and Ian Christie. When we visited Ian he took us to see snowdrops growing in a deep dell and others growing in a beech wood. While we were amazed at the Latvian wild flowers, Janis was impressed by sheer numbers of these 'wild' snowdrops in Scotland. We were met by the Earl of Dalhousie who lives in Brechin Castle. One of the Earl's ancestors fought in the Crimean War and he brought some *Galanthus plicatus* back home. These have hybridised with *G. nivalis* to produce some superb plants. We were pleased to be able to show Janis our castles and bulbs as he had been so kind to us. Next spring we hope to return to Latvia. Once we have read his book, I have no doubt our order list will be longer than ever.

On behalf of everyone in our party I want to record our thanks to Janis and Guna for organising an outstanding weekend. Who else could get the President to address rock gardeners?

Janis Ruksans' bulb list is illustrated in colour with lots of photographs and written descriptions of all the plants. If you send for a list you will be hooked.

**Janis Ruksans,
Bulb Nursery,
ROZULA,
Cesis distr.,
LV – 4150
LATVIA**



Sandy Leven Biography

I live with my wife Anne and family in Dunblane, Perthshire, in Central Scotland. I am a Dental Surgeon in nearby Stirling. I graduated from St Andrews University. I have been keen on gardening since childhood. In my parent's garden in Falkland in Fife I grew Dahlias, Chrysanthemums and general herbaceous plants.

Soon after graduating in 1969, I went to work in Inverness in Northern Scotland where I met Jim Sutherland, convenor of the local Scottish Rock Garden Club group. My interest in rock plants and bulbs blossomed from then. In 1975 Anne and I visited Keukenhof Gardens in Holland.

I have been Show Secretary of the SRGC Stirling show since it started in 1981. A few years later I helped found the SRGC Small Bulb Group, of which I am chairman and I organise the SRGC Early Bulb Display in February in Dunblane. This popular event features morning and afternoon lectures and a non-competitive bulb display. I grow a wide range of spring bulbs and Cyclamen, especially autumn flowering species. I have won several Forrest medals at SRGC shows and am one of 7 exhibitors to have been awarded a silver Forrest medal. [presented to those who win 10 Forrest medals].

I am a past president of the Scottish Rock Garden Club and am SRGC Publicity Manager. On behalf of the SRGC I designed and organised 9 gold medal winning displays at the RHS Scotland's National Gardening Show and the Gardening Scotland show which succeeded it. We won several 'Best in Shows' and once won the RHS Farrer trophy for the best exhibit of rock plants at any RHS show in the year.

I am vice chairman of the Royal Horticultural Society's Joint Rock Garden Plant Committee of which I have been a member since 1991. I am a member of The Alpine Garden Society and the North American Rock Garden Society and the Hardy Plant Society. I have written articles for the SRGC journal, 'The Rock Garden' and report on the SRGC shows for the club web site - srgc.org.uk.

I am a keen photographer and enjoy reading. I have travelled widely in the European and North American mountains looking at plants. I would love to visit New Zealand and South Africa when I have time.



Invitation

for the 24 - 25 October, 2008

In conjunction with the American Daffodil Society (ADS) Fall Board meeting in 2008 in Southern California, the Pacific ADS Region will be hosting their annual autumn daffodil meeting. We would like to extend a general invitation to all IBS members to join us for a symposium on the topic of Miniature Daffodils on Friday, 24 October 2008, and maybe a small autumn daffodil show. The Saturday program, 25 October 2008, would feature tours to see fall blooming daffodils in the Hampson, Howe & Koopowitz garden; a visit to Rogers Gardens (one of the greatest upscale nurseries in the USA) and ending with a banquet at Sherman Library and Gardens in Corona del Mar. The banquet speaker on Saturday will be Lawrence Trevanion from Canberra, Australia. In order to help with our advanced planning we need an estimate of the likely number of attendees. Could those thinking of attending please contact Harold Koopowitz at <mailto:paph2@earthlink.net> so we can get a count of the possible people attending. Please note, for those exploring attending this meeting that the closest airport is the John Wayne, Santa Ana, Orange County Airport. The hotel venue and registration details will be posted in due course.

Lachenalia sargeantii

REVISITED

by Graham Duncan

The appearance of the beautiful pink and ivory flowers of *Lachenalia sargeantii* was reported in 2005, thirty-three years after its flowers were last seen near Bredasdorp in 1971 in the southern part of the Western Cape, South Africa. The plant had originally been discovered in 1970 by Robert Scott, a visitor from New Zealand, while exploring a mountain near Bredasdorp following a large fire there the previous summer. *L. sargeantii* flowers in

early summer, and as with several other pyrophytic geophytes (those that only flower in response to fires), it blooms most prolifically in the first summer season following a fire, declining drastically the following summer to just a few flowering individuals, or producing no flowers at all. This species had previously only been known from the type locality, but much to everyone's delight, Cameron and Rhoda McMaster's 2005 discovery was of a new population,

located some distance to the west of Bredasdorp, growing in virtually identical montane fynbos habitat to the type locality. The plants grow in a harsh, windswept environment on the northern aspect of rocky ridges, and are usually most numerous in protected cracks between large boulders. They occur in large numbers, usually in groups or occasionally as solitary plants, and it is interesting to note that fewer than half the number of mature individuals produce flowers.

In addition to the appearance of flowers in some individuals, all the bulbs (both mature and semi-mature) reproduce vigorously in the winter growing season immediately following a fire by means of bulblets on short stalk-like structures, produced from the base of the bulb. Another interesting feature of all the mature bulbs and most of the bulblets is that in the wild they remain completely dormant in succeeding winter seasons following flowering, irrespective of whether sufficient



Lachenalia sargeantii

winter rains have fallen or not. These bulbs are thus adapted to remain dormant for years, or even decades, with dormancy being broken only by the occurrence of fires. A visit to the type locality in early summer some years ago, following good winter rains, revealed that none of the mature plants had produced any foliage, while a minimal number of bulblets had produced depauperate leaves. No fires have occurred over the type locality since 1971 and the mature bulbs have thus lain dormant there for thirty-six years.

Following more fires in February 2006 in different areas of the mountains west of Bredasdorp, a further two new localities revealed healthy populations later that year containing large numbers of plants including many flowering individuals; one colony was found by the McMasters and the other by a local group of conservationists. These recent finds show that this species is locally quite common in this part of the southern Cape and confirm a suspicion I've had for some time that it was not confined to a single population, but that its flowers and leaves are seldom seen due to their dependence on fire. Its conservation status has previously been categorized as 'insufficiently known', but can now confidently be re-categorised as 'not threatened', and further new populations will no doubt be found in future.

L. sargeantii is one of a group of only three pyrophytic species known for the genus, all of which occur in mountainous terrain on acid sandstone in different areas of the southern part of the Western Cape. The other two members are the white- and green-flowered *L. montana* (which resembles *L. sargeantii*), discovered by the German botanist and traveller Rudolph Schlechter in the late 1890's, and a new, very recently discovered species with creamy-yellow flowers (due to be published soon) that bloomed en masse following a fire in the summer of 2004. All three species flower at more or less the same time of year, from early to late November, and they all have deep-seated bulbs, which may be an adaptive strategy to escape damage from severe fires.

Although *L. sargeantii* produces leaves in cultivation reliably every year, it fails to flower. Smoke-treating the bulbs in the nursery at Kirstenbosch has not induced flowering so far, but I'm hopeful that treatment of the soil surface with burning fynbos material will eventually result in success.



Lachenalia sargeantii

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Flowers from the Bottom of the Globe

by Jane Preston

Nestled amongst the highland valleys of the Bannockburn Ranges in Central Otago in southern New Zealand I have concentrated on growing some unusual dry land bulbs and corms. These are being grown exclusively for the cut flower markets of the World.

The Eremurus Lily is the mainstay of a small thriving export cut flower business “Bannockburn Floriculture”. Plantings begun in 1990 on the property with direction and advice from my husband’s father, Stewart Preston, who was instrumental in finding plants to suit the environment. Other bulbs also doing well in this low rainfall (13” to 15”) climate are the *Allium* – around 20 varieties are grown for NZ bulb sales and local flower markets. *Trillium chloropetalum* is also grown under shade for niche

export cut flower markets.

The climate is strongly seasonal reaching 38 celsius (100°F) in dry baking summers and as low as -10 celsius (14°F) in the June – August winters.

Eremurus is pronounced e-ray-meu-rus, and the name is derived from the Greek eremos meaning desert and ouru meaning tail. They are commonly known as Foxtail Lilies and their stately spires of coloured blossom make a statement even on the arid plains of Afghanistan or the foothills of the Himalayas where they occur naturally. They tolerate the extremes of Central Asian heat and the mountain slope snows.

A plant with over 40 species, some of which have been grown in cultivation and hybridised for

130 years. The flowers are now well recognised as an outstanding cut flower internationally and come in a range of colours and shades. The Netherlands, Israel and the USA are the leading producers. However because New Zealand is in the southern hemisphere this allows for out of season production.

In this part of the world the large *Eremurus* buds push through in early August from large starfish like corms that sit just below the surface. By October their masses of strap like leaves form rows of dense green on the Central Otago property.

Now I manage the cut flower operation myself and it is a busy one, starting in early October with the newest crop, *Trillium chloropetalum*. These are cut at



Spires



Trillium chloropetalum



Eremurus elwesii



Eremurus robustus

60cm and just 40 boxes are sent annually and they are being well received in America and Japan in shades of burgundy red, white and cream.

Then the main *Eremurus* cutting starts in early November with the tall flower spikes of *E. elwesii* (pale pink) and *E. elwesii* 'Alba' (white) growing easily to two metres tall. They are followed by the giant (baby pink) *E. robustus* which can reach three metres – a

towering glory at the back of a border. Each variety cuts for about 10 days and after the early species the coloured hybrids Ruiter (1.5m) and Shelford (1m), which range in colours from vibrant orange, salmon, lemon, white, apricot and brilliant yellow, continue the flower sales till Christmas.

Like the alliums, *Eremurus* foliage dies back as the flowering begins so in a garden they look best when the flagging foliage is hidden by other plantings. The flower spikes of both species add architectural form to the garden.

Flower picking stages and much of the individual flower treatment have been worked out from research and ever continuing vase trials. I despatch all flowers only after they have been chilled, conditioned with sugars, fumigated with pyrethrum/permethrin gas for six hours and packed in sturdy flower boxes that are lined with tetron padding and breathable plastic liners.



Allium 'Globemaster'



Picking *Allium giganteum*



Flower Mix



October Snow

They travel from southern New Zealand – the bottom of the globe – to Export Companies in Auckland in the north of New Zealand, and from there they are sent to many countries including USA, Japan, Taiwan, Hong Kong, China, Philippines and Saudi Arabia. Up to 400 boxes are exported annually. Flowers arrive within 60 hours of picking and will then start opening from the bottom up and display for 10 days.

The remainder of our year is spent on local bulb sales. These comprise mostly alliums which thrive in the dry seasonal climate. About 20 varieties are grown and many are listed in the website catalogue including *A. schubertii*, *A. giganteum*, *A. karataviense*, A 'Gladiator' and A. 'Purple Sensation'. New Zealanders tend to be avid gardeners and alliums will flower in most of the country. *Eremurus* however does require frosts to initiate flower production but both enjoy a hot baking summer – as I do!

Jane Preston
www.foxtail.co.nz



E. 'Shelford'
orange



E. 'Shelford'



E. 'Ruiter' apricot



Jane harvesting

SEED COLLECTION PART 2

– and now the work begins!

Rod and Rachel Saunders

Having collected all our seeds (see Bulbs Vol 6 No. 1) in various parts of South Africa, the cleaning and processing has to begin. In fact, it begins even before we get home.

The first processing begins the same evening as the collection was made. All the seed packets are fully labelled – a date of collection, a name of some sort (often a tentative guess!), and locality details. Sometimes there may also be a reference to a digital photograph number on the packet, or when we really couldn't identify the species, a reference to a herbarium sheet that we made of the plant. In the car we carry as many books as we can – usually 8 or 10 selected according to our itinerary and the time of year. In July (mid-winter) we collect mainly tree seeds in the summer rainfall areas of the country, and there are virtually no bulbous plants in flower, so we will take tree and shrub books and no bulb books. In August and September we need books on Namaqualand annuals, bulbs, ericas, shrubs and trees, and more. The books most frequently used are those with good keys and preferably illustrations of some sort such as Field Guides and

specialised books on genera such as *Gladiolus*, *Ixia*, *Kniphofia* etc. However we also often use books such as "Cape Plants" by Peter Goldblatt and John Manning which is simply a list of all the species in the Cape Floral Kingdom, with basic keys and basic descriptions. Whichever books we have with us, we can be sure that there is at least one that would have been more useful which is sitting on the shelf at home!

On our travels we carry a set of laboratory sieves in one of the crates in the car, and if the seed is dry, we sieve it to get rid of unwanted bulk, and also to get rid of some of the insects which are lurking in the seed capsules. kniphofias and aloes are particularly bad in this respect – they are obviously very nutritious and the shape of the seed capsules is just right for insects of all sorts to hide in. The seeds are then dusted with a relatively mild insecticide to prevent further insect damage.

Tree seed poses particular problems of bulk as it often has pods or other bulky capsules which need to be crushed or split to release the seeds. Sometimes all that is required to open a pod, especially baubinsias, is



Romulea unifolia

warm air circulating around them. We place the un-open pods in sacks on the roof of the car and leave them there for a day or two as we travel. As the pods split they often go off with a bang like a pistol shot which is sometimes loud enough to wake us at night! Others, such as *Acacia* pods, can be split by hand, and this is done on the journey by whoever is not driving. However, some *Acacia* pods are indehiscent and the seed is only released when the pod is eaten by game or livestock. The pods have a sweetish smell and are normally brittle and hard, and they are eagerly sought out by game. To reduce the bulk of these, we place the pods in sacks and jump up and down on them, thereby crushing the capsules and releasing the seed. The resulting debris is sieved and the seeds retained. In this way, 30 – 40kg of raw material is reduced to a few hundred grams of clean seed.

Fleshy seed is usually cleaned the same day if water is available. If not, then it is packed into a leak proof container on the roof of the car where it cannot contaminate other dry seed. We carry a bucket and a large basin with us, so that seeds can be cleaned in rivers when available, or under taps in camp sites.

On the whole, bulbous plant seed is fairly simple – it is not normally too bulky, so requires a minimal amount of pre-cleaning. It is simply labelled and treated with insecticide, and put away.

And where does all this seed fit? When we pack our car, most things are packed into stackable plastic crates – food, rucksacks, boots, books etc. There are also many empty crates, both on the roof of the car and in the back. The seeds in their brown paper packets, are sealed with sticky tape, and are packed into these crates. The crates have holes in the sides and bottoms, so they allow good air circulation. This is important as there is almost always residual moisture in the seeds, and we certainly don't want to arrive home with moist and mouldy seeds.

On arriving home, the seed is unpacked and systematically sorted. First to be cleaned is recalcitrant and perishable seed, so this is all packed into 1 crate. Next in line is all the fleshy seed which must be cleaned before it ferments and gets too disagreeable! Then the seeds with the most insect pests – Irids and other bulbous plant seeds, aloes, acacias and other legumes. The harder more "insect resistant" seeds are left until the end, as are the succulents such as mesembryanthemums, and the host of unidentified nightmares!

The term "recalcitrant" is used to describe a type of seed that does not conform to normality. These seeds have no dormancy mechanism and regardless of conditions, they will germinate immediately on being separated from the parent plant. Most of the South African Amaryllids (except *Cyrтанthus*) fall into this



Tritonia florentinae



Romulea discifera

category (including nerines, brunsvigias, crinums etc). If we don't have a customer for these seeds immediately, we store them at 4°C to slow their germination, often in damp vermiculite to prevent them from drying out. If we are on a long trip, we usually send these seeds home by post and they are cleaned by our staff at work.

Fleshy seeds are steeped in water overnight, and the flesh is then pulverized so that it floats away with the water while the heavier seeds sink to the bottom of the bucket. Often several changes of water are required before the flesh is finally removed. Some seeds such as those of *Sclerocarya birrea* (marula, a large tree with edible fruit) have flesh which adheres firmly to the seed and it cannot be removed easily. Either these seeds are left in a plastic bag in the sun for several days until the flesh begins to ferment and soften, or they are cleaned in a cement mixer. Several kilograms of seed are placed in the cement mixer together with a quantity of stone chips, and this is rotated for several hours until all the flesh has been ground off. The seed is then washed and dried.

Legume seed is usually easy to clean, but because it is so palatable to insects, it needs to be processed quickly before it is all eaten. For the same reason, bulbous plant seeds also need to be processed quickly. These all follow the same routine – dry the capsules well, break them up and sieve out the seed. All the small bits and pieces which go through the sieve with the seeds are winnowed off by blowing. Rod, who cleans most of the seed, wanders round the garden while doing this, resulting in all sorts of strange plants coming up in odd spots! Although the seeds are heavier than the chaff, invariably some seeds blow off with the rubbish. *Gladiolus* seeds differ a bit in that they are firmly attached to the capsules. They are cleaned by drying them thoroughly so that the capsules open fully and expose the seeds, and then shaking the capsules in a bucket to release the seeds.

The cleaned seeds are usually put into new paper bags or packets, labelled carefully, treated with an insecticide if necessary, and then fumigated with Phostoxin for five days to kill any insects that hatch after cleaning and any larvae still lurking amongst the seeds.

After 5 days, the seeds are moved to our seed room and are catalogued – all

collecting information is recorded, and they are put away. The seed room itself is regularly fumigated with a pyrethroid to deal with any insects that have come in from outside. In the past we have had some really spectacular outbreaks of seed parasites, invariably in the bulb and Aloe seeds. It is a seed merchant's worst nightmare finding the seed room full of moths and beetles, and knowing that they have hatched somewhere amongst all the seed packets, or opening a packet of precious seed that took hours to collect, and finding that the seeds are full of holes!

If a plant has not been identified in the field, we will try to find a name at home where we have an extensive library and can key it out using one of the taxonomic monographs. If we still can't get a name, we will take it up to the Compton Herbarium at Kirstenbosch and enlist the aid of a friendly botanist.



Romulea hantamensis

We are surprised how often we come up with a plant that is undescribed – sometimes it has been collected previously but still has no name, and sometimes it has never been collected before. So far the list includes an *Ixia*, a *Romulea*, two *Babianas* and a *Hesperantha* that had not been seen for over 100 years. Often these discoveries occur because we are in the right place at the right time, and the right time is often an unusual time of year when botanists are not often in the field. The *Romulea* was discovered because we could not tell the difference between two yellow flowered species growing side by side. The only way we could distinguish between them was by the corm shape, and on digging up a corm of the new species, we realised that we had never seen anything like it before. The new species was named *Romulea discifera*, for the strange corm. “There is always something new out of Africa”!!

Do we ever make mistakes? No never! Well, hardly ever! Well, sometimes! Mistakes can occur because of the lack of flowers when one collects the seeds, so we are not always one hundred percent sure that the species we saw in flower is the same as the one whose seed we are collecting. Or if we are dealing with a large and complex genus, we sometimes simply make a mistake using the key. But sometimes the mistakes come about due to bad labelling! If Rod has been cleaning many *Gladiolus* species, and then changes to *Romuleas*, we will sometimes land up with strange species such as *Gladiolus amoena*, or *Romulea dalenii* – luckily these mistakes are usually picked up and rectified by the person putting the seed away, or Rachel when she enters the details on the computer.

And finally, how are all the species recorded? All the species that we collect are entered onto a database (Microsoft Access), with the family, genus and species, a description of the plant, and whether it is a bulbous plant, a succulent or a tree. If the seeds were purchased from someone, the price paid and the source is also included. This database is linked to a collecting list which has details on where we collected each species. In the past before we had a GPS, these collecting localities were quite complex – “15km past the T junction on the P1254 road between X and Y, under the tree on the left hand side”! The use of a GPS has obviously revolutionized this, and our collecting details are now far more boring – a plain “GPS 125”! We are also attempting to get a photograph of as many species as possible, and this is also entered onto the database. Digital photography is wonderful, but it has



*Veltheimia
capensis*

created a huge amount of work – on returning home all the images are downloaded, and then the identifying and labelling begins. We are all guilty of the same problem I am sure – because it is so cheap and simple to take multiple pictures of the same plant, we sometimes have 10 or 20 images of one species to sort through, and trying to decide which image is the best sometimes takes hours! The pictures are linked to the database, so if we have a species in stock and it reflects on the website, then there is a picture of it. As our catalogue often has 2000 species listed on it, we still have many photographs to take.

All in all, as you will see from the two articles that we have written, seed collecting is an extremely laborious task, but it affords us a good livelihood and a wonderful lifestyle.

This article is illustrated with pictures taken by the authors of some examples of the species which they collect.

Book Reviews

IRISES – A GARDENER'S ENCYCLOPEDIA

Claire Austin Timber Press, Portland, OR. Format: Hardcover, Pages: 340 pp.

Book dimensions: 8.5 x 11 in (280 x 215 mm) Illustrations: 1155 color photos

ISBN-13: 9780881927306 2005 \$49.95

The claims this book makes – over 1000 species, hybrids, and cultivars; irises for every climate and situation; more than 1100 photographs and a one /stop encyclopaedic reference, are well founded.

This beautifully presented book is not a reference book, nor is it a 'coffee table' book but it is a very accessible mix of the two. There is enough technical and botanical information for those wanting to learn about hybridising or how to grow something new. But there are also wonderful descriptions and photographs for identification purposes as well.

Each iris group is introduced with a short history and then discussion of the species, collected forms and cultivars. It is logical and clearly laid out. I particularly liked the good scattering of historic and older cultivars in each section, and there is

a good representation of French and American bred irises in the tall bearded section. Additionally, plenty of the Dykes Medal winners are shown and discussed.

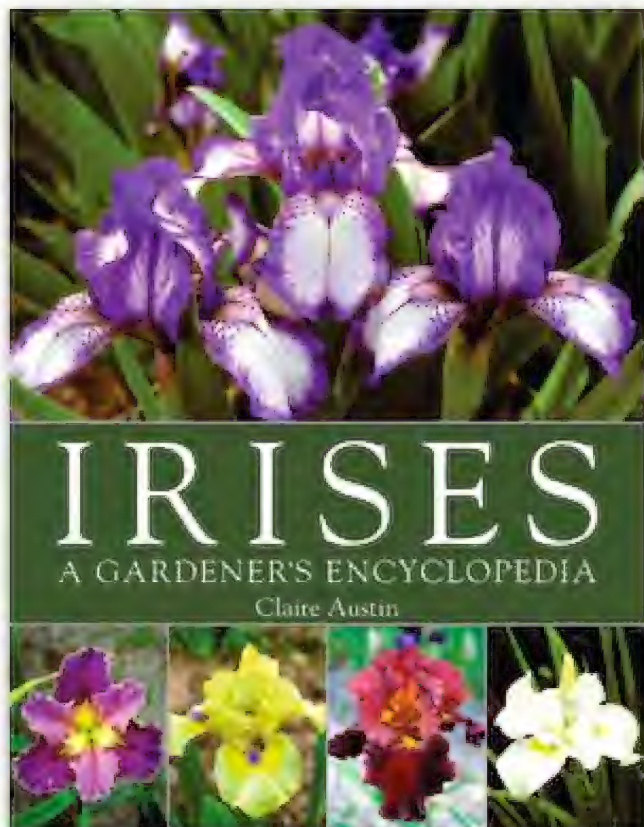
The Index is not presented as it is in many botanical books, which have a listing of species followed by the main index of cultivars. This is probably due to the encyclopaedic nature of this book. All the entries are listed alphabetically with the species italicised. This is very simple actually, and I think preferable for quick referencing.

Claire Austin has an impeccable background being the daughter of the rose breeder David Austin. She has been growing and exhibiting irises for over twenty years and has won many awards. She is also one of the photographers of this book. She modestly explains that this book is just a snapshot of the iris genus, and it is not the definitive work on the topic. "It would take thousands of pages to include just 10% of known Irises."

I think this book fills a real gap, as mentioned in the introduction, between reference and "glossy". I would recommend it to every bulb or garden group, and to anyone who can afford the indulgence of owning it.

Janet Matthews

*Past convenor of the
Albany Iris Group.
Auckland, New Zealand*



(Page 112)

Iris 'Star Shine'



(Page 220)

Iris 'Madeleine Hamilton'

BURIED TREASURES

Finding and Growing the World's Choicest Bulbs
Jānis Rukšāns Timber Press, Portland, OR.

Format: Hardcover, Pages: 460 pp.

Book dimensions: 7.38 x 10.38 in (265 x 185 mm)

Illustrations: 304 color photos, 4 maps

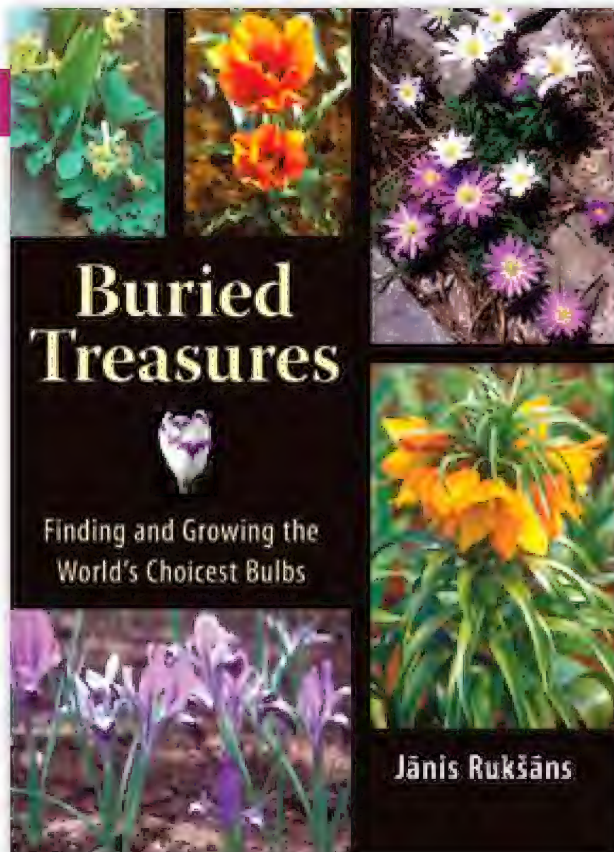
ISBN-13: 9780881928181 2007 \$39.95

As quoted by Chris Brickell in the foreword, "There is much in this book to inform, entertain, and tantalize gardeners whether or not they have a specific interest in bulbs".

Buried Treasures is a unique and very different bulb book; and the best bulb book seen in many years. What makes this book different from all others encountered is the exhaustive amount of research Jānis has contributed to the actual location in which these bulbs are found growing in the wild; and then transferring this knowledge into practical garden settings. This includes detailed descriptions of elevation, climate, drainage, and soil structure. This is what is

so lacking in many other bulb books that simply march through the species with either superficial descriptions or highly technical DNA counts and other technical information that does not help the average grower.

The book is basically divided into two sections – Bulbs in the Garden and Bulbs in the Wild. In the first section is some of the best information about growing bulbs from seed that is currently available. Jānis also includes a lot of other propagation instructions, which have been adopted by growers in Holland, and is



also very easy for the average grower to understand. A lot of practical and easy to understand advice about planting bulbs, harvesting bulbs, viral diseases, fertilizing, watering, pollination, and seed harvesting is also included.

In the second part of the book Jānis describes his many adventures as a bulb explorer – and these are his treasures! Jānis explored and researched in a time that will never be replicated and the stories he tells are simply remarkable. They show his enthusiasm, which as all bulb lovers know is a borderline obsession, on finding and introducing new species. What is particularly intriguing about this second section is that his travels and excursions and the subsequent discoveries are all keyed to the spectacular photos of the species found and described with fantastic detail. This is what is so lacking in bulb books today.

All of the 304 color photographs are of outstanding quality. There are a few special ones that stand out for me. On page 53 (plate 55) *Corydalis seisumsiana* was named in honor of his close friend and fellow plant explorer, Arnis Seisums. His picture is also found in *Buried Treasures*, along with many of the species he discovered as he and Jānis explored behind the iron curtain. Another great photograph on page 129 (plate 115) shows Jānis, in his youth, precariously perched on the side of a cliff looking for that special form of *Tulipa dubia*. But by far, my two favorite species photographs are on pages 213 and 214 (plates 162 and 163) of *Corydalis ruksansii* on location where Jānis discovered it at Shing (plate 162) and the outstanding blooming specimen in his garden (plate 163).

Page 129 (plate 115)
Jānis, in his youth!



Jānis Rukšāns is a world treasure himself for the collecting, exploring, growing, propagating, hybridizing, researching, and introductions he has contributed to the world of bulbs. Let's all hope Jānis Rukšāns has more buried treasures of books inside him!

Reviewed by Deborah
Jordan

Deborah Jordan has a BS in Geology and has taught gifted middle school kids Science in Houston, Texas for 20 years. She is an avid bulb enthusiast with a large collection of rain lilies, a huge collection of Louisiana Iris, and a large assortment of other bulbs she has grown mostly from seed.



Page 213 (plate 162)
Cordyalis ruksansii on location
where Jānis discovered it at Shing



Page 214 (plate 163) *Cordyalis ruksansii*
Outstanding blooming
specimen in Janus' garden

GARDEN BULBS FOR THE SOUTH

Second Edition, Scott Ogden, Timber Press, Portland, OR

www.timberpress.com Format: Hardcover Pages: 396 pp.

Book dimensions: 6 x 9 in (230 x 155 mm) Illustrations: 278 color photos

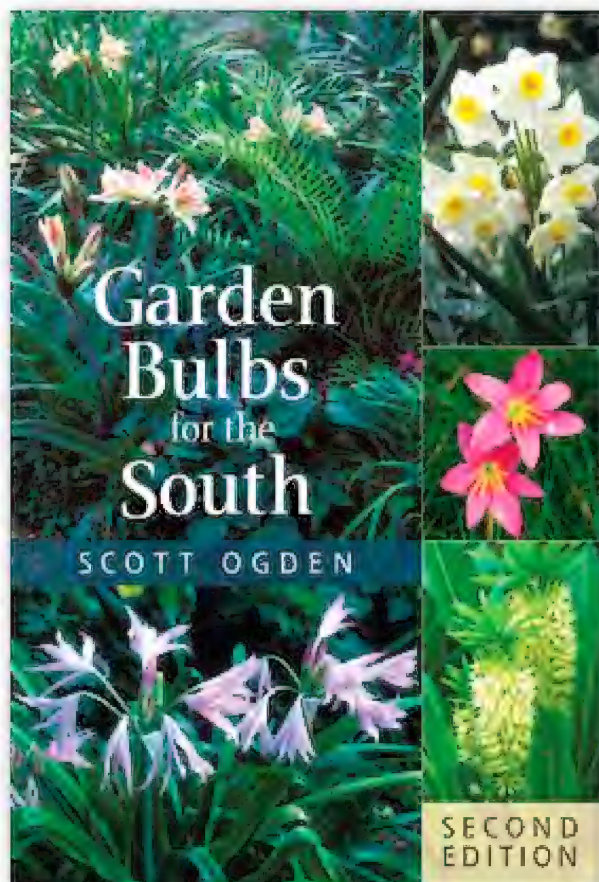
ISBN-13: 9780881928136 2007 \$34.95

The compact easy to handle size and wonderful color pictures on the dust jacket, make you jump right into this book. If you stop to read the inside front of the dust jacket, you will find this: "In a series of chapters that takes us through the gardening year....". However, do not overlook the table of contents, as I did, or the book's arrangement will seem confusing.

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After a two-page Preface, and only a four-page Introduction that includes naturalizing, a discussion of "bulbs and other devices", and botany, the book jumps right into a discussion of various plants.

Chapter 1, Rain Lily Day, gives a 30-page coverage of *Zephyranthes*, *Habranthus*, *Cooperia*, and their hybrids. For the more chronologically mature members of the International Bulb Society (IBS), or younger members who have read old issues of *Plant Life* and *Herbertia*, it will be *deja vu*. It is like



Dorothy in the “Wizard of Oz”, going from a drab black and white world to a world of invigorating color. The exploits and discoveries of Dr. Thad Howard and Morris and Katherine Clint and others are discussed in detail, only now there are beautiful color pictures instead of black and white photographs accompanying the text. Along with this history, there is much cultural and trivial information presented. However, from the arrangement of the book and the opening paragraph of this chapter a novice could come to the conclusion that these bulbs only flower in the autumn.

Chapter 2 continues the autumn theme with a discussion of *Nerine*, *Lycoris*, *Cyclamen*, *Sternbergia*, Autumn Narcissi, *Crocus*, *Eremurus*, *Allium*, *Scilla/Barnardia*, and my favorite, *Rhodophiala*. Great discussions of the characteristics and culture along with fantastic pictures made it hard to put the book down.

Moving with delight to Chapter 3, which covered plants that flower (not bloom) during the winter months, found the same in-depth coverage of various species of *Narcissus*, *Crocus*, Algerian Iris, Roman Hyacinths, *Ipheion*, *Anemone*, *Ranunculus* and Winter Cyclamen.

Chapter 4, “Jonquils and Kin”, had a good presentation on the genus *Narcissus* but then *Leucojum* and *Galanthus* are thrown in at the end. These all may be in the same family, but they are not really close kin to the Jonquils. I think they are all spring treasures and could have been included in that chapter.

Chapter 5 on “Spring Treasures” covers *Allium*, *Tulbaghia*, *Nothoscordum*, *Dichelostemma*, *Triteleia*, *Androstephium*, *Erythronium*, *Trillium*, *Polygonatum*, species tulips, *Muscari*, *Scilla*,



Lycoris squamigera



Rhodophiala bifida



Hymenocallis liriosme

Ornithogalum, *Camassia*, *Zigadenus*, and *Schoenocaulon*.

Chapter 6 is where the yearly theme of the book breaks down. What do you do with bulbs that flower in late spring or early summer? Ogden starts grouping them botanically in this chapter titled: “Irises, Gladioli, and Shellflowers”. Genera covered are: *Iris*, *Gladiolus*, *Moraea*, *Hermodactylus*, *Dietes*, *Freesia*, *Sparaxis*, *Crocsmia*, *Tigridia*, *Alophia*, *Nemastyllis*, *Herbertia*, *Cypella*, *Gelasine*, *Calydorea*, *Neomarica*, *Sisyrinchium*, *Aristea*, and *Belamcanda*. Others are mentioned in passing.

Chapter 7 continues the botanical grouping with “Crinums and Spiderlilies”. A very interesting and informative discussion of the genera *Crinum*, *Hymenocallis*, *Eucharis*, and *Pancratium* is presented, along with great photographs. However, the information presented will be of limited value if one is trying to identify an unknown species or cultivar. Oddly, tucked away between *Crinum* and *Hymenocallis*, under a discussion of *Amarcrinum*, is a brief mention of *Amaryllis belladonna*, *A. x parkeri*, and *Brunsvigia*. No mention is made of crosses between *Amaryllis belladonna* and *Brunsvigia* (*xAmarygia*) and no photographs are provided for *Amaryllis* and *Brunsvigia*.

Chapter 8 takes a weird turn and goes to “Summer Glories”, which is strange because many of the genera covered flower during spring in the South and not summer. This chapter starts out with the genus *Lilium*. Genera also included in this chapter are: *Gloriosa*, *Littonia*, *Alstroemeria*, *Dichorisandra*, *Commelina*, *Dioscorea*, *Anredera*, *Asparagus*, *Eucomis*, *Agapanthus*, *Polianthes*, *Manfreda*, *Milla*, *Bessera*, *Leucocoryne*, *Hypoxis*, *Rhodohypoxis*, *Bletilla*, *Achimenes*, *Begonia*, *Dahlia*, *Amoreuxia*, and *Oxalis*.

Other genera covered in this chapter that I am sure are of interest to IBS members are: *Hippeastrum*, *Sprekelia*, *Crytanthus*, *Scadoxus*, and *Nerine*. The discussion of *Hippeastrum* was interesting with much of the history and origin of hybrids covered and a number of species mentioned. However, the only species pictured was *H. striatum*. The section on *Sprekelia* was good but brief. *Crytanthus*, *Scadoxus*, and *Nerine* are covered in less than two pages with only *C. obrienii* and *S. multiflorus* pictured.

Chapter 9 continues the scheme of grouping plants and delves into Cannas, Gingers, and Aroids.

Of the 63 pages in this chapter, eight are devoted to Cannas so the majority covers Gingers and Aroids. Genera of gingers covered includes: *Hedychium*, *Curcuma*, *Zingiber*, *Alpinia*, *Globba*, *Siphonochilus*, *Costus*, *Cornukaempferia*, and *Kaempferia*. The pictures of the *Kaempferia* and *Costus speciosus* 'Variegatus' made me drool.

The section on aroids covered such plants as: *Philodendron selloum*, *Alocasia*, *Calocasia*, *Xanthosoma*, *Caladium*, *Amorphophallus*, *Sauromatum*, *Arisaema*, *Arum*, *Arisarum*, and *Zantedeschia*.

The final chapter, "Designing with Southern Bulbs", offers many different ideas for using bulbs in the landscape accompanied by pictures of examples. Topics covered include: "What Bulbs Do for Gardens", "Foils, Alternates, and Guilds", "Bulbs in Grass", "Other Companions", "Bulbs in Gravel", "How Many? What Style?", "Color, Texture, and Light", "Fragrance", "Cultivation and Irrigation", "Mediterranean Beds", "Bulbs for Heavy Soils", and "Bulbs for Shade".

To me, the arrangement of the chapters and material seems somewhat jumbled, but is easily overlooked. My biggest disappointment was the use of botanical terms with no or poor definitions and confusion over the types of underground stems grouped under this book as "bulbs". The discussion on "bulbs and other devices" was weak and confusing with such statements as: "These stem tubers are known as corms." and "... corms completely replace themselves each season, often forming new tubers atop the shriveled remains of the old." The confusion

between
tubers
and corms

continues under such plants as *Amorphophallus*: "The globular corms send up only a single leaf but this is so marvelously built and branched as to suggest a small palm tree. If the tubers are large ...". *Cyclamen* is listed as having tuberous roots instead of true tubers.

Despite the listed problems, this book is an easy and delightful read and introduces the reader to many different geophytes. The pictures are great but it is disturbing when a plant is mentioned but pictures are not provided, especially for less common genera. However one could always go to the Gallery on the IBS web site www.bulbsociety.org and see examples. This book will not serve as a good reference for identification and should not be purchased for that purpose. However, it does excel at introducing the reader to many different geophytes and offering suggestions for how they may be successfully used in the southern landscape. So many different plants are covered that even the most experienced reader may be introduced to a new plant.

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Biography

Mark Schusler grew up on the South side of Chicago. His childhood idol was Luther Burbank. He worked in wholesale-retail growing greenhouse, retail florist, research nursery, and did freelance landscape design and installation. He received a B.S. degree in Ornamental Horticulture and M.S. degree in Horticulture from the University of Illinois at Champaign-Urbana. Research and thesis was on the composting and utilization of pine and hardwood barks as container media for nursery and greenhouse crops.

Mark moved to Texas to teach Horticulture at Tarrant County College. Currently a tenured member of the faculty as Assistant Professor and Coordinator of the Horticulture program and about to complete 30 years teaching. He has taught over 25 different credit and non-credit Horticulture courses, and has received

Costus speciosus
'Variegatus'



Kaempferia elegans



Kaempferia sp. 'Hieroglyphics'



several awards for excellence in teaching including the Golden Apple Award, and the Chancellor's Award for Academic Excellence.

He became interested in *Hippeastrum* in 1980 after receiving a few Mead Strain hybrids from his wife's Aunt in Houston, Texas. He started breeding with those and since then has been growing and breeding *Hippeastrum*. Between two very hard freezes, and his wife's moving as a Methodist preacher, there have been numerous setbacks in the breeding department. Mark is also interested in *Habranthus*, *Zephyranthes*, *Datura*, *Iris*, and *Belamcanda*.

Originally a member of the American Plant Life

Society, Mark received training and certification as an Amaryllis Judge for APLS from Elinora Legatski of Houston, Texas. While not an overly active member in the International Bulb Society, he has been to a couple of the meetings, donated a few items to the Bulb Exchange, and participated in a few discussions on the internet.

Mark now resides in Springtown, Texas with his wife Nancy. They have two grown and married daughters who live in Houston and

Mertens. He continues to breed and grow Amaryllids, and shares his information on growing and breeding with many in the Fort Worth area.



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